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UNIVERSITY OF COLORADO, BOULDER

Natural Hazards Research and
Applications Information Center

A SELECTED BIBLIOGRAPHY ON

DISASTER PLANNING AND SIMULATION

David R. Morton
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INTRODUCTION

This informal bibliography has been compiled from annotations appearing in bibliographies prepared by the National Hazards Research and Applications Information Center with the exception of citations attributed to 1) William A. Anderson on page 24; 2) Russell R. Dynes and E.L. Quarantelli (p. 25); and 3) E.L. Quarantelli and Russell R. Dynes (p. 28). These citations previously appeared in "An Annotated Bibliography on Disaster and Disaster Planning -- 2nd Edition," prepared by Mr. Quarantelli for the Disaster Research Center at Ohio State University.

American Institute of Architects (AIA) Research Corporation. Hazards Program, 1735 New York Avenue, NW, Washington, D.C. 20006.
Seismic design for architects - (video-tapes).
Specifications: 45-50 minutes; 3/4 inch tapes; black/white; rental fee is $5 per tape, $15 per set.

The following five video-tapes comprise a series on seismic design considerations for schools, firms, continuing education, chapters or other organizations.

Tape 1---Land Use Planning, by George G. Mader. This tape discusses the importance of seismic safety in the land use planning process. Examples are given of seismic safety elements incorporated in various components of land use planning.

Tape 2---Building Form and Configuration, by Christopher Arnold and Eric Elsesser. The importance of form and configuration in seismic design is discussed and various configuration problems and solutions are presented.

Tape 3---Structural Considerations, by Thomas D. Wosser. Significant structural concepts in structural seismic design and common framing systems are discussed in terms of earthquake resistance.

Tape 4---Nonstructural Hazards, by John L. Fisher. This tape reviews past earthquake performance, and discusses design concepts, problems, and solutions for nonstructural elements in seismic design.

Tape 5---Seismic Renovation/Retrofit, by Daniel Shapiro. Factors influencing seismic renovation/retrofit techniques and design considerations are discussed.

American Institute of Architects (AIA) Research Corporation. 1735 New York Avenue, N.W., Washington, DC 20006.
Seismic design for police and fire stations. 1978.
305p.

In the event of a major earthquake disaster, the police and fire departments can expect to be pushed to the limit of their abilities to perform critical services that the public expects of them. For both groups to operate with maximum efficiency, it will be necessary for the stations from which they operate to remain functional throughout the disaster. This report attempts to identify, define, and develop seismic design considerations for use by the architectural and public safety professions. Specific design facets considered include: protection of personnel; protection of hazardous materials used in the crime laboratory; protection of communication facilities; layout of emergency operations centers; protection of fuel storage facilities; and the design of detention facilities. The text is illustrated with many floor plans and construction details.

Association of Bay Area Governments. Earthquake Preparedness Program.
Earthquake intensity and related costs in the San Francisco Bay Area. 1978.
12p. plus 6 maps.

A methodology is presented for producing both an earthquake intensity map and a cumulative economic risk map. Risk maps can relate the expected damage to particular types of buildings taken over time, and they can indicate the total expected percent damage due to earthquakes resulting from any of the major active faults in the Bay Area. Risk maps may also be useful in designating areas where special caution is needed in the construction of new buildings. It is noted, however, that intensity-cost information is not a sufficient basis for engineering decisions at a given site, since these require specific knowledge of the process causing damage.

Association of Bay Area Governments. Hotel Claremont, Berkeley, CA 94705.
A guide to ABAG's earthquake hazard mapping capability. 1980.
171p.

Since early in 1979, the Association of Bay Area Governments (ABAG) has been developing a series of computer-based map files showing various basic data maps related to earthquakes. Other maps derived from this information are being developed to illustrate the extent of different types of hazards associated with earthquakes. The project has been provided with a flexible design which supplies an ongoing capacity for the expansion and refinement of its products. Contained in the guide are descriptions of 1) the basic data map files, 2) the hazard map files, 3) several applications for the map files, and 4) a set of ten working papers. Some of the products currently available treat tsunami inundation, liquifaction susceptibility, inundation from dam failure, a composite land use map, and an assessment of property and population at risk. The computer program used by this project is closely tied to ABAG's BASIS program, which has as a major objective the development of a regional geographic data base that can be directly used in local, as well as regional, planning applications. An appendix contains tables which list the number of hectares at risk for certain hazards by both political jurisdiction and by the type of land use.

Association of Bay Area Governments. Hotel Claremont, Berkeley, CA 94705.
We're not ready for the big quake: what local governments can do, by Terry Margerum. 1980. $3.00 plus 75¢ postage.
36p.

Utilizing an intelligently conceived and highly readable format, this booklet conveys a great deal of information about earthquakes and the potential for mitigating their effects. In general, the report describes the likelihood and consequences of a major Bay Area earthquake; what's being done to reduce hazards; why more isn't being done; what local government can be doing; state and federal legislation that would help reduce hazards; and selected resources and references. Although written

specifically with a California distribution in mind, local officials in any seismically vulnerable area will find not only edifying material but also a variety of means for effectively communicating it to others. For example, there is a novel chart which depicts the ill-understood Richter Scale of earthquake magnitudes that should jar even the most sanguine bureaucrat from his/her complacent attitude about the destructive power of earthquakes. The text is liberally spiced with a number of rather blunt quotations from some of the most experienced earthquake researchers in the U.S.

Joint Committee on the San Fernando Earthquake Study, Earthquake Risk: Conference Proceedings. Sponsored by the Joint Committee on Seismic Safety of the California Legislature, 1971, 151pp.

Includes articles on social benefits versus risk; decision-analysis in uncertain conditions; earthquake insurance; geologic hazards, risk and the decision-making process; costs and benefits of earthquake adjustments; liability resulting from earth movement; and others.

California Seismic Safety Commission, 455 Capitol Mall, Suite 535, Sacramento, California 95814.

Goals and policies for earthquake safety in California, by Stanley Scott, et al. 1979.

76p.

The goals and policies in this report represent the California Seismic Safety Commission's present consensus on the most important seismic safety goals for the State's residents. It was prepared to force attention on the fundamental issues, to communicate what the Commission believes ought to be accomplished over the long run, and to help the Commission decide on specific work projects to be undertaken. Topics discussed include: a multi-level governmental partnership for seismic safety; regulation of land use; the problems associated with building design/construction, hazardous structures, critical facilities, and lifelines; dealing with earthquake prediction, preparedness, response, and recovery; promoting earthquake information, education and training; and financing and research needs for earthquake safety. Among the many policy recommendations are the following: 1) the legislature should periodically review the State Emergency Fund, and, if warranted, increase the amounts available for disaster assistance; 2) the availability of disaster assistance, special appropriations, and private aid should be conditioned on the proper observance of codes, standards, and procedures; 3) where appropriate, fees and special charges should support selected seismic information programs. The usefulness of the report is enhanced by a subject index.

California Seismic Safety Commission. 1400 10th Street, Suite 108, Sacramento, CA 95814.

Report on state agency program for seismic safety, by Christopher J. Wiley. 1979.

164p. (prepared under contract S.B. 1279-1)

In addition to providing budget information to the Seismic Safety Commission (SSC), this report provides detailed information about various California agencies involved in seismic safety programs. Background material for the SSC's Earthquake Hazard Reduction and Prediction Systems Study also was incorporated into the report. The programs, which are being carried out by at least 15 state agencies, are grouped under six headings: disaster preparedness, earthquake information, scientific investigations, existing hazards, new construction, and policy. Each program lists items such as authorization, objectives, legislative intent, clients, and products. A few of the programs will indicate the diversity of seismic safety measures being undertaken in California: 1) Earthquake Prediction Response Plan ,2) Public School Disaster Preparedness Plans, 3) Elevator Retrofit, 4) Hospital Act Compliance, 5) Subdivision Public Report, 6) Utilities Construction Review, and 7) Fire and Life Safety Review for School, Public, and State Buildings.

Creative Home Economics Consultants. P.O. Box 813, Downey, CA 90241.

How to survive an earthquake: home and family preparedness, by Libby Lafferty, Harriett Paine, Vicki Pellerito, Shirley Smith and Sandy Stave. 1977. $2.50.

34p.

This manual offers practical advice for earthquake preparedness and survival in a modern society. While the family is stressed as a response unit, the information is useful to anyone living in an earthquake-prone area. If a unit, such as the family, has prepared itself with adequate psychological and material response mechanisms, an emergency can be handled more efficiently with greater safety and comfort for all members of the group. Emphasis is laid on developing a family plan, assigning specific responsibilities, establishing accountability, and developing a meaningful rehearsal procedure. Emergency procedures are clearly articulated for sanitation, fire, utility disruption, food and medicine storage, and for personal safety during the earthquake. The group approach might be adaptable to larger social units like apartment complexes, schools or dormitories.

Earthquake Engineering Research Institute.

Learning from earthquakes: 1977 planning guide. 1977.

41p.

The Planning Guide is available at no cost from: EERI Secretary, 424-40th Street, Oakland, CA 94609. A separate volume which combines the Planning and Field Guides is also available at $5.00, which covers costs of handling and mailing.

The EERI is probably best known for its field investigations and reporting of the effects of destructive earthquakes and its recent efforts to coordinate the investigative work of other organizations, a function it particularly stresses. It is chiefly concerned with coordinating the learning opportunities in seismic safety which will result from future quakes. After presenting basic information on earthquakes and seismology, the Handbook concentrates on techniques and an organizational structure for investigating a quake. A California emphasis is reflected by information appearing in the appendices. Examples are a "List of Organizations Participating in Engineering Investigations of California Earthquakes," and an agency responsibility assignment chart for implementing a west coast investigation. Also included is a bibliography of publications describing damage caused by both domestic and foreign earthquakes.

Hisada, Toshihiko

Preparations for facing an earthquake: earthquake preparedness of big cities in Japan. Tokyo: Kajima Institute of Construction Technology. 1976.

12p.

Available at the University of California's Earthquake Engineering Library, 47th Street and Hoffman Boulevard, Richmond, California 94804.

Dr. Hisada discusses in a non-technical manner a variety of subjects relevant to large urban clusters located in active seismic belts. The urgency of this subject is underlined by his estimate that as much as 1/6 of the global earthquake energy is released in or around the Japanese Islands. History of Japanese earthquakes and their periodicity are briefly mentioned. A general overview of damage prediction for several large cities is included. These urban areas are highly prone to fires that break out simultaneously in the aftermath of a strong earthquake. Oil and gas heaters fitted with a safety device have been required as a preparedness measure. Town planning is an important objective in order to minimize damage and casualties, and significant steps have been taken in this direction. Of interest are some countermeasures for city facilities. Examples: Railroads are working on plans to equip their trains with a seismograph-linked device so that an earthquake will signal the train to come to an emergency stop; superannuated and wooden bridges are being replaced with noncombustible, aseismic bridges; elevated highways are equipped with a device to prevent the fall of a damaged girder.

Kreimer, Alcira.
Post-disaster reconstruction planning: the case of Nicaragua and Guatemala. Mass Emergencies 3 (1978), pps. 23-40.

Natural disasters often draw attention to societal problems that tend to surface during post-disaster reconstruction. The aftermaths of both the 1972 Nicaragua and the 1976 Guatemala earthquakes are analyzed for societal effects which were compounded by many years of underdevelopment. In both instances the poor were most affected by the disasters. Conditions such as malnutrition, housing shortages, illiteracy, urban congestion and massive poverty are accentuated and become public knowledge. In Nicaragua, basically an urban disaster, reconstruction was shaped by a vertical decision-making structure which led to a highly centralized operation. Influential people made the important decisions while the government failed to set the necessary regulations to control development. In Guatemala, impacted mostly in rural areas, decision-making was decentralized almost to the point where the government avoided taking responsibility in the reconstruction process.

Midwest Research Institute. 425 Volker Boulevard, Kansas City, Missouri 64110.
Earthquake risk and damage functions: an integrated preparedness and planning model for New Madrid, by Ben-Chieh Liu, et al. 1979. 372p.

The primary purpose of this study is to develop a body of information and data essential to a better understanding of the social and economic consequences of earthquakes striking the New Madrid seismic zone. Questions are investigated which relate to: 1) seismic risk to life and property, 2) acceptable limits of social and economic seismic risk factors, 3) how an increasing population density will be affected by seismic risk over the next 50 years, 4) whether an unacceptable risk factor can be technically reduced, and 5) whether scarce resources can be efficiently utilized to minimize seismic risk. The study reports that the New Madrid area has a 10 per cent probability of experiencing an earthquake with a maximum Modified Mercalli intensity of IX over the next 50 years, and that predicted damage levels are considerably lower than previous estimates. It was found that current land use planning in several areas virtually excluded any earthquake preparedness plans and mitigation programs specifically designed for coping with earthquake hazard. Also, no continuous or permanent education policies for improving public awareness of the hazard were found; no significant risk reduction plans were observed; and specific building and zoning codes for earthquake hazard reduction were nonexistent in almost all of the fifteen counties investigated.

National Academy of Sciences. National Research Council, Committee on Seismology.

Earthquake research for the safer siting of critical facilities. 1980. $5.50.

49p.

Available from the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418.

This panel report examines the question of whether our society possesses adequate information in order to minimize earthquake hazard when sites need to be selected for critical facilities. The report focuses on long-term research programs rather than on shorter, mission-oriented research. Among the types of facilities considered are dams, nuclear power and processing plants, high-level radioactive waste storage and isolation sites, and chemical processing factories. Another category of facilities scrutinized are hospitals, lifelines, police and fire departments, and other organizations whose ability to function following an earthquake are vital to public safety. The report provides a review of the geologic and seismologic data basis available for siting, and offers specific recommendations that should encourage decision makers and scientists to develop new and useful siting information.

Olson, Robert A. and Mildred M. Wallace, eds., Geologic Hazards and Public Problems: Conference Proceedings. Office of Emergency Preparedness, Region Seven, Santa Rosa, California, 1969, 335pp.

Contains 20 articles on various aspects of several geologic hazards, concentrating on earthquake hazard and the Pacific Coast region.

Selkregg, Lidia, Edwin B. Crittenden and Norman Williams, Jr., "Urban Planning in the Reconstruction." In: The Great Alaska Earthquake of 1964: Human Ecology. National Academy of Sciences, National Research Council, Committee on the Alaska Earthquake, Washington, D.C.: 1970, 186-239.

An analysis by community of the planning that took place after the earthquake, to what extent planning was implemented, and reasons for lack of or change in implementation. Concludes with suggestions for urban planning with regard to disasters and the proper role of federal and state government in that effort.

William Spangle and Associates, Inc., H.J. Degenkolb & Associates, and Earth Sciences Associates.
Land use planning after earthquakes, by George Mader, et al. 1980. 158p.

Published by William Spangle and Associates, Inc., 3240 Alpine Road, Portola Valley, CA 94025.

Prepared under a grant from the National Science Foundation, the study focuses on actions and decisions taken after an earthquake which lead to permanent reconstruction. Furthermore, in the sense that post-earthquake decisions can be viewed in terms of their impact on future seismic safety, the measures can be considered hazard mitigation efforts for areas noted for recurrent earthquakes. The major portion of the volume is composed of case studies of post-earthquake reconstruction at three U.S. locations: San Fernando, California; in Alaska following the 1964 Good Friday disaster; and Santa Rosa, California. A fourth case study on reconstruction after the massive Laguna Beach landslides of 1978 is also included because of similarities in the land use planning problems. An important part of the project was to identify situations where a land use response, as opposed to the more commonly invoked engineering or structural response, is more appropriate to a lasting mitigative condition. Among the study's many findings, perhaps the most notable was that ordinary land use planning procedures and regulation have not been very effective in shaping the course of reconstruction except where there has been unusual political agreement on their use. In general, recommendations tend to support the concept that land use planning and regulation in the U.S. is primarily a local government function. Suggestions are designed to preserve local prerogatives and state responsibilities while recognizing the necessity to protect the federal government's large-scale financial investment.

Steinbrugge, Karl V., Earthquake Hazard in the San Francisco Bay Area: A Continuing Problem in Public Policy. University of California, Berkeley: Institute of Governmental Studies, 1968, 80pp. See also "Earthquake Hazard Abatement and Land Use Planning: Directions Toward Solutions." In: Geologic Hazards and Public Problems: Conference Proceedings, edited by Robert A. Olson and Mildred M. Wallace. Office of Emergency Preparedness, Region Seven, Santa Rosa, California: 1960, 143-152.

Discusses public policy for reduction of earthquake loss in the Bay Area with regard to geologic faults, structurally poor ground, earthquake-induced landslides, seismic risk from vibrational sources, non-earthquake resistive construction, fire following an earthquake, and the role of specific governmental agencies in dealing with the earthquake problem.

United Nations Educational, Scientific and Cultural Organization.
7 Place de Fontenoy, 75700 Paris.

The assessment and mitigation of earthquake risk. 1978. $23.00. 341 p.

Available from Unipub, Box 433 Murray Hill Station, New York, NY 10016.

At the Intergovernmental Conference on the Assessment and Mitigation of Earthquake Risks, held at Unesco Headquarters in February, 1976, papers were presented that dealt with physical and social aspects of earthquake risk. Contributions in the social science area included studies on "The Process of Human Adjustment to Earthquake Risk," "Insurance and the Economic Consequences of Earthquakes," and "Social and Administrative Implications: Protection, Relief, Rehabilitation." Other important aspects of earthquake risk are examined with selections on both seismic zoning and microzoning, earthquake prediction, induced seismicity, and building codes and materials. The earthquake-resistant design of nuclear power plants, large dams, and public utilities is each treated separately. Resolutions of the Conference suggest that a multidisciplinary approach be taken towards future risk research. Also, short-term training courses and seminars are needed to help disseminate current knowledge to a wider group of researchers and technicians. The problem of safeguarding historical monuments against earthquake damage seldom has merited any special attention, because proper care and strengthening pose difficulties quite different from those of contemporary structures.

United Nations. Office of the United Nations Disaster Relief Coordinator. Reference Unit, UNDRO, Room C-435, Palais des Nations, 1211 Geneva 10, Switzerland.

Disaster prevention and mitigation: a compendium of current knowledge. Vol. 3. Seismological aspects. New York: United Nations. 1978.

127p. (GE.78-1364(8800) -- UNDRO/22/76 Vol. 3)

UNDRO's "Disaster Prevention and Mitigation" series aims first to identify the existing knowledge and expertise which may be applied directly toward the prevention of natural disasters, particularly in developing nations. Secondly, it attempts to identify the gaps in current knowledge which require concerted action by the international community. Volume three addresses the professional planner and manager as well as the informed layman. Basic information necessary to understand the current status of seismology is presented, often utilizing graphs, diagrams, and mathematics to illustrate a point. Extensive chapters on: "The Role of Seismology in Land Development and Town Planning"; "Basic Parameters for Calculating Structures"; and the "Economic Consequences of Earthquakes" are particularly relevant for planners.

U.S. Executive Office of the President. Office of Science and Technology Policy.
Earthquake hazards reduction: issues for an implementation plan. 1978. 231p.

A limited supply of single copies is available upon written request from the Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, Virginia 22202.

The Working Group on Earthquake Hazards Reduction, chaired by Karl Steinbrugge, was given responsibility for developing a plan to implement the "Earthquake Hazards Reduction Act of 1977" (Public Law 95-124). This report represents an initial step in the preparation of the national earthquake hazards mitigation plan. Assistance was provided by an advisory group drawn from universities, and state and local governments, practicing engineering and consultant organizations. Thirty-seven issues are stated, their background discussed, alternatives are given, and conclusions drawn. Issues involving private and public financial institutions and land use planning are given considerable attention.

U.S. Dept. of the Interior., Geological Survey.
Program and plans of the U.S. Geological Survey for producing information needed in national seismic hazards and risk assessment, fiscal years 1980-84, by Walter W. Hays. 1979.
40p. (U.S.G.S. Circular 816)

A copy may be obtained free of charge upon application to the Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, Virginia 22202.

Acting to meet the provisions of the Earthquake Hazards Reduction Act of 1977 (Public Law 95-124), the U.S.G.S. has developed comprehensive plans for producing information needed to assess seismic hazards and risk on a national scale in fiscal years 1980-84. Both U.S.G.S. and non-U.S.G.S. personnel will take part in the program. The text provides a general discussion of seismic risk research and the user needs of this research for federal agencies, state and local governments, and various professional skills in the private sector. A number of user concerns and recommendations related to national seismic hazards and risk products are listed. They include: the U.S.G.S. should help in the education of public officials and the various users of seismic hazards and risk assessment products; the simplest risk assessment products should be developed first, in addition to publishing intermediate products and dated maps; it should construct maps for specific uses as well as those for a "general purpose" use; and the U.S.G.S. should develop a process for introducing change in a seismic hazards or risk assessment map and implement it, involving the entire scientific and engineering community in the process.

U.S. Dept. of the Interior. Geological Survey.
Seismic safety and land-use planning: selected examples from the San Francisco Bay region, California, by M.L. Blair and W.E. Spangle. 1979. $5.50.
82p. (USGS Professional Paper 941-B)

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock number is 024-001-03231-7.

California's notorious susceptibility to large magnitude earthquakes is examined and described in seismic risk terms such as potential dollar loss, injuries and deaths, population exposure, and probable scenarios. Seismic hazards are overviewed in order to provide background for a discussion of ways to improve seismic safety. A systematic approach to assessing seismic risk is given, and examples of various techniques are summarized. Typical planning responses of local government to seismic risk are shown to relate to the nature of the hazard and the level of development in areas identified as hazardous. The roles of federal, state, and areawide organizations in responding to seismic hazards are summarized, and examples are given of specific state and regional programs drawn from California and the San Francisco Bay region. This report, written by planners, shows how information on seismic hazards can be effectively incorporated into land-use planning and decisionmaking to reduce seismic risk. It is a companion volume to a previous report (Professional Paper 941-A) that was written by earth scientists to present the state-of-the-art for seismic zonation in the San Francisco Bay area.

United States Office of Science and Technology, Report of the Task Force on Earthquake Hazard Reduction: Program Priorities. Washington, D.C.: 1970, 54pp.

Presents and explains 28 major recommendations for earthquake hazard reduction, divided into three categories: benefits in less than five years, benefits between 5 and 10 years, and long-term benefits.

University of California, Berkeley. Institute of Governmental Studies, 109 Moses Hall, University of California, Berkeley, CA 94720.
Policies for seismic safety: elements of a state governmental program, by Stanley Scott. 1979.
94p.

This study, which relies heavily on California's experiences over the past 70 years, overviews the essential criteria for a manageable seismic safety program. Although California has taken many initiatives in seismic safety over the years, a great deal still needs to be done in order to cope with the magnitude of earthquakes that assuredly will occur in the area in the future. Impressive accomplishments have been achieved in some areas, such as building codes, but other areas like disaster preparedness still receive a small percentage of funds allocated to seismic safety. California's progress in seismic safety has proceeded largely in fitful jumps and jolts with improvements often resulting from the

stimulus of a damaging earthquake. A comprehensive plan is needed to assimilate the knowledge already gained, to provide a constant monitoring of the adequacy of safety measures, and to keep a watchful eye for hazards that are not being dealt with. Topics discussed include: research needs for earthquake policy formulation; California's experience with seismic safety for schools and hospitals; California city and county seismic hazard plans; and programs related to the seismic safety of dams.

University of California, Berkeley. Institute of Governmental Studies, 109 Moses Hall, University of California, Berkeley, CA 94720.
What decisionmakers need to know: policy and social science research on seismic safety, edited by Stanley Scott. 1979. $2.65.
38p. (Research Report #79-5)

This publication is based on a workshop convened by the Committee on Social Science and Public Policy Research of the Earthquake Engineering Research Institute (EERI) in February, 1979. Nine presentations were distilled from informal discussions which reflect the viewpoints of professional people from the fields of geology, engineering, architecture, urban planning, and the social sciences. Each of the contributors indicates the issues of seismic safety that are in particular need of attention from public policy and social science researchers. Some of the topics that are examined are 1) the social costs of future earthquakes, 2) failures in past public policy research, 3) research needs relative to land use planning, 4) types of seismic safety policies, and 5) prospects for policy research under the Earthquake Hazards Mitigation Program at the National Science Foundation. A number of noteworthy suggestions are offered, such as Robert Olson's observation that many politicians, contrary to what they say, are not particularly interested is supporting social science research. This is because questions may be raised about how and why decisions are made, or how resources are allocated, that will prove uncomfortable to people in high places.

University of California, Los Angeles. Chemical, Nuclear, and Thermal Engineering Dept. School of Engineering and Applied Science, UCLA, Los Angeles, CA 90024.
Earthquake ordinances for the City of Los Angeles, California: a brief case study, by Kenneth A. Solomon, David Okrent, and Mark Rubin. 1977.
51p. (UCLA-ENG-7765)

The L.A. Building Dept. has identified 300 "high risk" buildings, and has intimated that as many as 14,000 more may exist within the City. City Council has considered the need for seismic improvement of old buildings for some years past, but has not definitively acted upon the matter. Unfortunately, the surest and most invigorating stimulus for earthquake building code modification seems to be the event of a damaging earthquake itself, witness the California ordinances enacted after 1906, 1933, and

1971. Special features of the report include: a summary of significant events and laws transpiring after February 9, 1971; projected risks in the L.A. area for older buildings; and the proposed code amendments for earthquake safety for existing assembly occupancies as revised after 4/20/76 by the Board of Building and Safety Commissioners.

University of Colorado, Institute of Behavioral Science, Program on Technology, Environment, and Man. Boulder, 80309.
Earthquake and tsunami hazard in the United States: A research assessment, by Robert S. Ayre. 1975.
150p. (NHRAIC Monograph #5)

Available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161, as PB 261 756. Paper Copy: $8.00. Microfiche: $3.50.

Discusses the nature of the two hazards and their adjustments, and recommends a shift in research direction. Research into land use management; earthquake-proofing; earthquake prediction and warning; insurance; community preparedness, relief and rehabilitation; and earthquake reduction are discussed. A simulation of California earthquakes is presented.

FLOODS AND COASTAL ZONE HAZARDS

Clay, Grady, ed.
Water and the Landscape. New York: McGraw-Hill. 1979. $19.50.
191p. (A Landscape Architecture book)

This is an anthology of 39 articles that appeared in Landscape Architecture magazine during the years 1970-1978 and which have a general theme of large-scale planning for water-related development. One section of five articles specifically deals with planning around natural hazards. Projects examined include the Indian Bend Wash in Scottsdale/Tempe, Arizona, and the reconstruction of Hilo, Hawaii following the destructive 1960 tsunami. A few contributions take a general approach to hazard planning while others present planning solutions along riverine and coastal areas where flood hazard is one of several factors under consideration. The articles exhibit a variety of stimulating ideas that urban planners and flood plain managers may find useful for incorporation in nonstructural flood plain projects. Examples of such articles are 1) "A Stragegy for Watershed Development...That Beats the Bulldozer by Using Land-Sale Profits to Preserve Greenspace"; 2) "Ponding Against the Storm"; and 3) "Self-Imposed Limits to Development in the Carolina Tidewater."

Conservation Foundation.

Coastal environmental management: guidelines for conservation of resources and protection against storm hazards. 1980. $5.50. 161p.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock number is 064-000-00009-8.

The Conservation Foundation prepared the Guidelines for the Council on Environmental Quality, the Office of Coastal Zone Management, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Environmental Protection Agency, and the Federal Emergency Management Agency. Specifically designed to help local officials cope with problems such as the issuance of wetland permits and the interpretation of flood insurance regulations, the book also provides much valuable ecological information justifying sound environmental practices along America's coasts. The policies are stated in simple terms, and are supported by background materials, implementation suggestions, and references to relevant laws and regulations. As the title implies, emphasis is placed on mitigative practices directly related to natural hazards. Each of the Guidelines' seven sections deals with hazards as they pertain to distinct coastal ecosystems: coastal uplands, coastal floodlands, saltwater wetlands, banks and bluffs, dunelands, beaches, and coastal waters and basins. There is a summary of federal programs and regulations (by agency) that are most relevant to local coastal zone management. The text is clearly written and the diagrams, drawings, and photographs are well-chosen to illustrate the point under consideration.

Institute of Public Administration. 55 West 44th St. New York, NY 10036.

LIF report phase II: evaluation and recommendations for legal, institutional, and financial methods for implementing purposes and plans for flood plain management in the Connecticut River Basin, by Ruth P. Mack. 1976.

382p.

Available form NTIS, Springfield, VA., 22161, as PB 253 122. $10.00-paper copy, $2.25-microfiche.

Purpose of this study was to examine ways to optimize flood plain use in this river basin. Findings as a whole relate specifically to this area.

Miami University. Institute of Environmental Sciences, Geography Department, Miami, Ohio 45056.

A plan for the development of the Great Miami River Corridor (Miami and Shelby Counties, Ohio). 1976.

290p. plus plates.

The Miami Valley Conservancy District is one of the first agencies to emphasize flood plain management through non-structural measures. This study presents a detailed conceptual plan for 1) flood control, 2) recreational use, and 3) optimizing agricultural and open space use in a flood plain well known for its destructive floods. Numerous "linkages" between various facets of the plan allow considerable flexibility during the long term realization of the project. Many of the improvements that are suggested offer unique and imaginative uses for the flood plain. While the preservation of prime agricultural land is an obvious concern, the development of local recreational facilities seems somewhat frivolous until one recognizes that dwindling energy resources predicate less traveling to remote facilities and a greater reliance on recreation areas and resources closer to home.

New England River Basins Commission. 55 Court Street, Boston, Massachusetts 02108. (617) 223-6244.
The river's reach: a unified program for flood plain management in the Connecticut River Basin. 1976. 292p.

Available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161 as PB-270 079/7GA. Paper copy: $12.00, Microfiche: $3.00.

Substantial progress has been made to control floods in the Connecticut River Basin since 1936, but considerable damage still occurs almost every year. Further plans and suggestions for improving the existing system are presented. A new and crucial stage is beginning for the Basin in which primary responsibility for initiating action will fall to the states and local authorities. Although a specific locale is treated by the study, considerable information is presented pertaining to problem definition and resolution that other flood-prone areas will find useful. Experience gained from dealing with multi-level governmental agencies in assigning responsibility priorities is noted throughout the report. There are many illustrative photos, maps, diagrams, and charts. Useful information in the eight appendices includes: Connecticut Basin directories; federal flood plain management and related financial assistance programs; a glossary; selected bibliography of technical reports; and an environmental impact statement.

Parker, Dennis J. and Donald M. Harding.
Planning for urban floods. Disasters 2 (1978), No. 1: 47-57.

This is a study about the experiences of three flood prone settlements in the Welsh Borderlands where the main nonstructural flood adjustments consist of relatively strict control of flood plain development, and flood warning and emergency evacuation schemes. British research into flood hazard

has indicated, as American research has, that a broad approach to flood loss reduction should be based on adjustments that are not strictly of an engineering nature. The provision of accurate and timely public information is essential for many British settlements, but methods of disseminating such information and evaluating its effects are weakly developed. While the importance of understanding factors that condition public perception and awareness of flood hazard is quite clear, it is often ignored in practice.

Smith, Keith and Graham Tobin.
Human adjustment to the flood hazard. London & New York: Longman Group, Ltd. 1979. $10.50.
130p. (In the series: Topics in Applied Geography)

Despite a growing understanding of flood hydrology, the application of an ever more complex technology, and the expenditure of progressively larger amounts of capital, losses due to riverine flooding continue to rise. This book overviews this paradoxical situation, reviewing both structural and non-structural measures instituted in past years. Specifically, it attempts to demonstrate, on an introductory level, the practical significance of developing and implementing an informed approach towards efficiently alleviating flood hazard. A comprehensive examination is made of flood plain management strategies, after which, a case study of the Cumbrian Eden is used to demonstrate the complexities associated with riverine management. The authors contend that responsible authorities have failed to contain flood hazard because of inadequate planning and partial mitigative strategies. The mistakes previously made with structural adjustments have been repeated with non-structural measures in that such schemes have been implemented with comparatively little regard for social feasibility or acceptance. To improve adjustment, authorities need a broader perspective of the problem, they should plan more comprehensively, and they should consider the desires and capabilities of each individual community.

Susquehanna River Basin Commission. 5012 Lenker St., Mechanicsburg, PA 17055.
Planning guide: Self-help forecast and warning system, Swatara Creek watershed, Penna., by Stewart K. Wright. 1976.
58p. (Publication no. 42)

Outlines a detailed plan for a forecast and warning system for areas in which warnings and forecasts are not routinely generated by the National Weather Service.

Tennessee Valley Authority and University of Tennessee, Water Resources Research Center.
Flood damage prevention. An indexed bibliography, ed. by John W. Weathers. October, 1976.
61p.

Available from TVA, Division of Water Management, Knoxville, Tennessee 37902 and Water Resources Research Center, the University of Tennessee, Knoxville, Tennessee 37916.

Lists 800 titles by year. Includes a subject index. The majority of the titles emphasize nonstructural measures for flood damage prevention.

United Nations. Dept. of Economic and Social Affairs.
Guidelines for flood loss prevention and management in developing countries. New York, 1976.
$11.00.
183p. (ST/ESA/45; Sales no. E.76.II.A.7; Natural Resources/Water Series no. 5)

The first section deals with policies, planning and organization for flood loss prevention within the context of national or regional development. The flood problem, improving the planning process, the range of choice and selection of adjustments, and management considerations are discussed. The second section discusses data collection and analysis, and land use regulation. The third discusses preparedness for emergencies.

U.S. Dept. of Commerce. National Oceanic and Atmospheric Administration. Office of Coastal Zone Management. 3300 Whitehaven St., N.W. Washington, D. C. 20235. (202) 634-6791.
Natural hazard management in coastal areas, by Gilbert F. White, et al. November, 1976.
249p.

The handbook consists of 1) an executive summary, 2)a definition and discussion of possible adjustments for the major coastal hazards: hurricane, flood, coastal erosion, landslide, earthquake, tsunami, volcano, avalanche and land subsidence, 3) a section on problems and recommendations, and 4) a discussion of hazard management in each of the thirty coastal states. Section 5 is an annotated bibliography; section 6 a directory of federal, state and voluntary agencies concerned with natural hazards in the coastal zone. The six appendices include legal aspects of coastal zone hazard management, possible adjustments to regional hazards problems, and a checklist of relevant state programs.

U.S. Dept. of Commerce. National Technical Information Service.
Coastal zone management and planning. Volume 1: 1964-1976 (a bibliography with abstracts), by Robena J. Brown. 1978.
260p.

Available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161, as NTIS/PS-78/0326/5GA. Paper copy: $28.00. Microfiche: $28.00.
The planning and management of both natural resources and urban growth in the coastal zone are covered in this bibliography. The topics include management and planning policies involved in: ecology, water rights, environmental problem, land use, fisheries, recreation, economic development, and shore protection. Government administration and citizen participation studies are included. (This updated bibliography contains 255 abstracts, none of which are new entries to the previous edition).

U.S. Dept. of Commerce. National Technical Information Service.
Coastal zone management and planning. Volume 2: 1977-January, 1978 (a bibliography with abstracts), by Robena J. Brown. 1978.
148p.

Available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161, as NTIS/PS-78/0327/3GA. Paper copy: $28.00. Microfiche: $28.00.
The annotation for Volume 2 is the same as for Volume 1. (This updated bibliography contains 143 abstracts, 96 of which are new entries to the previous edition.

U.S. Dept. of Commerce. National Technical Information Service.
Flood control. Volume 2: 1975-July, 1977 (a bibliography with abstracts), by Robena J. Brown. 1978.
255p.

Available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161, as NTIS/PS-78/0773/8GA. Paper copy: $28.00. Microfiche: $28.00.
Research studies are presented involving floods as related to control, forecasting, urban planning, prevention, zoning, urbanization, and land use management. Flood control studies for specific towns and reports, generated by the Army Engineers which deal with specific areas have been excluded. (This updated bibliography contains 248 abstracts, none of which are new entries to the previous edition).
See also---Volume 1, 1964-1974, NTIS/PS-76/0593.

U.S. Dept. of Commerce. National Technical Information Service.
Flood control. Volume 3: August, 1977-July, 1978 (a bibliography with abstracts), by Robena J. Brown. 1978.
71p.

Available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161, as NTIS/PS-78/0774/6GA. Paper copy: $28.00. Microfiche: $28.00.
The annotation for Volume 3 is the same as for Volume 2. (This updated bibliography contains 64 abstracts, all of which are new entries to the previous edition).
See also---Volume 1, 1964-1974, NTIS/PS-76/0593.

U.S. Defense Dept. Army Corps of Engineers, Hydrologic Engineering Center, Water Resources Support Center.

Flood emergency plans: Guidelines for Corps dams, by H. James Owen. 1980.

47p.

Copies are available from the Corps' Hydrologic Engineering Center, 609 Second Street, Davis, CA 95616.

Over the past few years, a new concern for dam safety and flood emergency evacuation planning has resulted in a revision of requirements for federal dam safety. The principal components of a dam emergency plan, i.e., identification of the emergency, notification procedures, emergency operations and repair, and evacuation are thoroughly discussed. Of interest to emergency planners is the Corps' contention that dam emergency plans must be prepared in considerable detail because 1) since emergency plans and evacuation plans are seldom subject to testing, their workability can only be assured through careful consideration of every detail, 2) plans that are vague or that require significant interpretation to decide appropriate action may lead to serious errors of judgment when employed under hurried and stressful conditions, and 3) emergency plans that need to implemented under short notice usually involve complicated inter-organizational facets that could fail under stress or communication difficulties. Although the guidelines presented here are directly applicable only to the Corps program, much of the material is relevant to dam safety programs of state and local governments and other federal agencies. Two case studies applying the guidelines, detailed instructions for preparing inundation maps, and a summary of relevant literature will be published at a later date as appendices.

U.S. Dept. of Defense. Army Corps of Engineers. Institute for Water Resources, Kingman Building, Fort Belvoir, Virginia 22060.

Physical and economic feasibility of nonstructural flood plain management measures, by William K. Johnson. 1978.

220p.

Available at no cost for single copies from The Hydrologic Engineering Center, U.S. Army Corps of Engineers, 609 Second Street, Davis, CA 95616.

Eleven nonstructural flood plain management measures are investigated for both physical and economic feasibility. Each one is examined for its mitigative feasibility, economic feasibility, a summary of its advantages and disadvantages, an engineer's cost estimate, and a list of important references. Zoning ordinances, subdivision regulations and building codes, the public acquisition of flood plain land, and flood insurance are considered to be nonstructural measures. Five appendices present information such as detailed damage analyses used in establishing economic feasibility; a summary of engineer's cost estimates for selected measures; and information which was developed during the investigation which was thought to be of use for those who consider forecast, warning, and evacuation as nonstructural alternatives. Applications of every measure investigated were found in flood plains around the country. The literature--published papers, reports, etc.--have been an exceedingly poor indicator of the application of these measures. Individuals and communities simply act to reduce flood losses and these actions rarely result in a written document. The resourcefulness and creativity of these actions is often amazing. Bibliography with over 100 entries.

U.S. Executive Office of the President. Federal Coordinating Council for Science, Engineering, and Technology. Ad Hoc Interagency Committee on Dam Safety Programs, Washington, DC 20500.
Improving federal dam safety. 1978.
179p.

This report completes the second phase of the work requested by President Carter in April, 1977. Dated November 15, 1977, and revised July 1, 1978, it is the collective result of all federal departments and agencies that have responsibility for the licensing, construction, operation, regulation, maintenance, technical assistance, or financial assistance for construction of dams. Although the committee's review reveals generally sound procedures in most aspects of project development, it suggests that seven major practice and procedural changes could be adopted by the agencies to improve their individual standards. A number of other recommendations together with suggestions for implementing improved practices also are detailed in the report. Included in the appendices are three subcommittee reports concerned with site investigation and design (37 pages), construction (33 pages), and operation and maintenance (24 pages).

Task Force on Federal Flood Control Policy, A Unified Program for Managing Flood Losses. 89th Congress, 2nd Session, House Document 465. Washington, D.C.: USGPO, 1966, 47pp.

Outlines recommendations for a federal flood management program covering the improvement of basic knowledge, coordinated and planned flood plain developments, technical services to flood plain managers, insurance, and adjusting federal flood control policy to sound criteria and changing needs. Includes discussions of: "What is Happening on the Nation's Flood Plains" and "Principles Bearing on the Problem of Flood Damages."

U.S. Dept. of the Interior. Geological Survey.
Flood-prone areas and land-use planning: selected examples from the San Francisco Bay Region, California, by A.O. Waananen, W.E. Spangle, et al. 1977.
75p. (Geological Survey Professional Paper 942)

For sale from the U.S. Government Printing Office, Washington, D.C. 20402; stock number 024-001-02970-7.

The S.F. Bay study focuses on an issue of national concern--- how best to accomodate orderly development and growth while ensuring public health and safety, and minimizing degradation of our natural and manmade environment. Methods of gathering and

using flood-plain information for planning in this specific locale are applicable to other parts of the country. Examples cited from the study and other interpreting reports have been selected to demonstrate the wide range of tools available to planner and resource manager when effective, rational growth is the criteria to be examined. Human usage of the flood-plain has always exacted a price; traditional structural measures for mitigating flood loss have been only partially successful. Citizen awareness and managerial planning expertise are essential to minimize flood loss.

U.S. Dept. of the Interior. Office of Water Research and Technology.
A process for community flood plain management. 1979.
115p. (Planning Manual OWRT TT/79 9)

Inquiries about availability of the manual should be directed to Ken Suter, Office of Water Research Technology, Dept. of the Interior, Washington, DC 20240.

With the advent of a greater emphasis being placed on nonstructural strategies for coping with recurrent flood damage, the OWRT has compiled a manual which facilitates translating these concepts into practical use. Communities which lack the resources to hire a full-time flood planning staff should find the manual helpful in easing the difficulties associated in obtaining and using both financial and technical assistance. The manual overviews the options and managerial tools that are now available from a variety of governmental agencies for shaping a successful flood hazard reduction program. Among the features are a simulated flood plain management program, a table of options for controlling flood plain use, a summary evaluation process for assessing flood plain problems, and a checklist of managerial methods and tools. A particularly useful chapter provides a brief analysis of the legal framework of flood plain management. For those who wish to study in-depth a particular aspect of flood management, there are numerous references to important source documents. Most of the important policy-making organizations for flood hazard mitigation in the nation contributed to the development of the manual.

U.S. National Science Foundation.
A report on flood hazard mitigation. 1980.
253p.

As of December, 1980, copies are available free of charge while the supply lasts from Edward H. Bryan, Sanitary/Environmental Engineering, National Science Foundation (NSF), 1800 G Street, N.W., Washington, DC 20550.

This report is the result of a study carried out by the NSF for the House Committee on Science and Technology. A group of specialists representing expertise from a variety of disciplines and administrative experience was responsible for preparing the report. Two major findings resulted from the study: primary responsibility for flood hazard mitigation efforts should be at the local government level, and social aspects of floods deserve a great deal more attention than they have had in the past. Within the report's format, there is a description of the nature and causes of

both riverine and coastal flooding; trends in the geographical distribution of flood losses; a discussion of mitigation alternatives to reduce flood losses; a review of the public and private institutions established to cope with flood hazard; eleven case studies; and lastly, an outline of a plan for multidisciplinary analysis to determine the effectiveness of public policies for flood hazard mitigation. Many conclusions and recommendations are offered, among which are: 1) urbanization increases flood peaks on small streams from two to six times, 2) flood hazard mitigation strategies should reflect mixes of structural and nonstructural approaches, 3) potential benefits from structural flood control measures are often lost through subsequent, unwise development in supposedly protected areas, 4) action should be taken to eliminate flood insurance subsidies after repetitive flooding in high hazard areas, and 5) all levels of government should accelerate the acquisition of the most flood prone areas for open space uses.

U.S. Water Resources Council. 2120 L Street, N.W., Washington, DC 20037.
Unified national program for floodplain management (revised).
1980. $4.00.

Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock Number is 052-045-00058-4.

Since it was first issued in 1976, a number of factors have prompted a revision of the report. These factors include: the President's 1977 Environmental Message; Executive Order 11988 on Floodplain Management; Executive Order 11990 on the Protection of Wetlands; and the President's Water Policy Reform Message of 1978. The report describes a unified, cooperative effort by all levels of government and the private sector to minimize loss of life, property and environmental values within floodplains. A conceptual framework is set out to guide local, state, and federal decision makers toward balanced consideration of alternative goals, strategies, and tools. Improved comprehensive local floodplain management efforts under the National Flood Insurance Program, the Coastal Zone Management Program, the Clean Water Act, and other programs are also described. At all governmental levels, innovative floodplain management efforts encompassing a wide range of tools and stressing nonstructural mitigative approaches are being increasingly emphasized.

University of Colorado, Institute of Behavioral Science,
Program on Technology, Environment and Man.
Boulder 80309.
Flood hazard in the United States: A research assessment, by Gilbert F. White. 1975. $8.00.
141p. (Monograph #NSF-RA-E-75-006)

Discusses the flood problem in the U.S. and the changing mix of adjustments to floods. Alternative approaches are deminstrated by means of scenarios. Five major lines of research which would be likely to reduce flood losses are discussed: 1. improving control and protection, 2. warnings and flood proofing, 3. land management, 4. insurance, relief, and rehabilitation, and 5. basic data and methods.