

National Earthquake Resilience - Research, Implementation, and Outreach

Committee

Robert M. Hamilton

Chair

ROBERT M. HAMILTON, chair, is a seismologist with a primary interest in natural disaster loss reduction. Currently, he chairs the NRC Committee on Earth System Context for Hominid Evolution and recently traveled to Iran for the NAS with a delegation of earthquake engineers to promote cooperation in the area of earthquake science. Previously, he represented NAS on a committee dealing with natural disaster loss reduction for the InterAcademy Panel on International Issues, an association of approximately 80 of the world's science academies; chaired the Committee on Disaster Reduction for the International Council for Science; chaired the Scientific and Technical Committee of the International Decade for Natural Disaster Reduction-IDNDR (a United Nations program for the 1990s); and served for two years with the IDNDR Secretariat in Geneva, including a year as director. In addition, he has been a member of the Inter-Agency Task Force for the International Strategy for Disaster Reduction, a follow-on United Nations program to the IDNDR. He also chaired the Subcommittee on Disaster Reduction of the NSTC. Further, Dr. Hamilton led a USGS project on earthquake loss reduction in the Eastern Mediterranean , and chaired the Working Group on Early Warning Capabilities for Geological Hazards that prepared a report for the UN General Assembly. He has also served on the NRC committee for U.S.-Pakistan science and technology cooperation, conducted field research in Kenya related to geothermal energy, and coordinated earthquake research projects in the former Soviet Union , China , and Latin America . Dr. Hamilton's career included seven years with the NRC, serving as an executive director and a deputy executive director. Before joining the NRC, he served thirty years with the USGS, in positions including Deputy for Earthquake Geophysics; Chief of the Office of Earthquake Studies; Chief Geologist; Coordinator of the Deep Continental Studies Program; and Acting Chief of the Office of Earthquakes, Volcanoes, and Engineering. He also served as chair of the federal Subcommittee on Natural Disaster Reduction and acting coordinator of the Earthquake Hazards Reduction Program. Dr. Hamilton has served as president of the Seismological Society of America, president and secretary of the Seismology Section of the American Geophysical Union (AGU), and was elected a Fellow of the Geological Society of America (GSA) and the American Association for the Advancement of Science (AAAS). Dr. Hamilton's awards include the Colorado School of Mines Distinguished Achievement Medal in 1984, Distinguished Service Award on the Department of Interior in 1986, and Senior Service Presidential Merit Rank in 1987. He is the author of over 50 published scientific reports and articles. Dr. Hamilton received a degree in geophysical engineering from Colorado School of Mines, and M.A. and Ph.D. degrees in geophysics from the University of California at Berkeley.

Richard A. Andrews

Member

RICHARD A. ANDREWS has over thirty years' experience in emergency management, counter-terrorism policy, and seismic safety. He is a member of the Homeland Security Advisory Council, which provides policy guidance to DHS and the FEMA National Advisory Council. He chairs the Council's Senior Advisory Committee on Emergency Services, Law Enforcement, Public Health and Hospitals. He served as director of the California Office of Homeland Security and Homeland Security Advisor to Governor Arnold Schwarzenegger from 2004-2005. From 1991 to 1998, Dr. Andrews was director of the Governor's Office of Emergency Services for California, where he managed the emergency response and recovery efforts for 19 presidential and 24 gubernatorial disasters. He is a member of the World Bank's Disaster Management Operations Group and has worked on emergency management projects in Turkey, Algeria, Romania and India. In November 2003, he presented testimony to the 9/11 Commission on strategies for enhancing public-private partnerships. A past president of the National Emergency Management Association (NEMA) and former executive director of the California Seismic Safety Commission, Dr. Andrews has also been a member of the NRC Committee on Assessing the Costs of Natural Disasters and Panel on Real-Time Earthquake Warning. He is the former chair of NEMA's Private Sector Committee as well as a public-private task force formed to explore ways in which the Emergency Management Assistance Compact—a Congressionally ratified organization that provides form and structure to interstate mutual aid—might be employed to more effectively use private sector resources during major emergencies. Dr. Andrews received an A.B. from DePauw University, and an M.A. and Ph.D. from Northwestern University.

Robert A. Bauer

Member

ROBERT A. BAUER is an engineering geologist and head of the Engineering and Coastal Geology Section of the Illinois State Geological Survey (ISGS) of the Institute of Natural Resource Sustainability (INRS) of the University of Illinois. He has worked with Illinois state emergency managers on exercises and workshops since 1990 and is the ISGS/INRS representative to the state's emergency operations center. He has participated on the earthquake scenario committees and hazard map production for the Illinois state-wide earthquake assessment. He is the ISGS/INRS' representative and State Geologist Technical Director, program coordinator, and past-chair of the Association of the Central U.S. Earthquake Consortium State Geologists. He serves on the Illinois Seismic Safety Task Force, EERI New Madrid Scenario Executive Committee, and provided important input to the FEMA New Madrid Catastrophic Planning Scenario subcommittee. He has authored over 90 publications, and is a member of the Geo-Institute of ASCE, Association of Engineering Geologists, Society of Mining Engineers of the American Institute of Mining, Metallurgical, and Petroleum Engineers, International Association of Engineering Geologists, and EERI. Mr. Bauer received a B.S. in geological science from the University of Illinois at Chicago, and an M.S. in engineering geology from the University of Illinois at Urbana-Champaign.

Jane A. Bullock

Member

JANE A. BULLOCK is a principal at Bullock and Haddow, LLC, a disaster mitigation consulting firm and is an adjunct professor at the Institute for Crisis, Disaster, and Risk Management at George Washington University. Ms. Bullock has over 25 years of private and public sector experience culminating in responsibility, as chief of staff, for the daily management and operations of FEMA, with its responsibility for disaster mitigation, response, and recovery. In the course of her career, she directed the restructuring and streamlining of the agency, set policy and programmatic direction for the nation's emergency management systems, served as the agency's spokesperson, and worked with Congress and the nation's governors to enhance disaster management throughout the United States. As chief of staff, she administered FEMA's \$2.5 billion disaster relief fund and provided management oversight for the response and recovery of over 300 major disasters. She was chief architect of Project Impact: Building Disaster Resistant Communities, a nationwide, grassroots effort by communities and businesses to implement mitigation and risk reduction programs. In 2000, she received the Presidential Rank Award, the highest award presented by the President to a career civil servant. Since leaving FEMA, Ms. Bullock has worked with a variety of organizations to design and implement disaster management and homeland security programs. In the post-Katrina environment, she has worked with Save the Children to design and implement their domestic disaster response and recovery program. She testified before both House and Senate committees about the future of emergency management after Katrina. Internationally, she has worked with countries in Central and South America, Eastern Europe, and New Zealand on implementing disaster management and mitigation programs. Ms. Bullock continues to be active in the media as a nationally recognized expert on disaster management, with regular appearances on National Public Radio, Public Broadcasting Stations, CNN, CBS, NBC, and ABC. She is the coauthor of textbooks on emergency management, homeland security, climate change and mitigation, and a Living with the Shore book series dealing with the design and construction of communities in hazardous areas. Most recently, she was appointed to serve on President Obama's Transition Team for the Department of Homeland Security.

Stephanie E. Chang

Member

STEPHANIE E. CHANG is an associate professor at the University of British Columbia, where she has joint faculty appointments with the School of Community and Regional Planning and the Institute for Resources, Environment, and Sustainability. She holds a Canada Research Chair position (tier 2) in Disaster Management and Urban Sustainability. Much of Dr. Chang's work aims to bridge the gap between engineering, natural sciences, and social sciences in addressing the complex issues of natural disasters. Some of her research has focused on developing integrated regional models for estimating losses from future earthquakes. She has also developed methods for assessing disaster mitigation strategies and researched how disasters impact regional economies. Her current research addresses community disaster resilience and sustainability, mitigation of infrastructure system risks (especially electric power, water, and transportation), and urban disaster recovery. She is particularly interested in applications to cities of the Pacific Rim. Prior to joining UBC, she was a research assistant professor in the Department of Geography at the University of Washington. She has also worked as a researcher and consultant with ABS Consulting in Los Angeles and Seattle. Dr. Chang was awarded the 2001 Shah Family Innovation Prize by EERI and serves on the editorial board of Earthquake Spectra. She recently served on the National Research Council's Committee on Disaster Research in the Social Sciences. Dr. Chang received a B.S.E. in civil engineering and operations research from Princeton University, and an M.S. and Ph.D. in regional science from Cornell University.

William T. Holmes

Member

WILLIAM T. HOLMES is a vice president and structural engineer at Rutherford and Chekene, Consulting Engineers, a multi-disciplinary engineering firm. Mr. Holmes has 40 years of practical experience in all aspects of designing structures, particularly design for protection from earthquake effects. In addition to traditional structural engineering design of buildings, Mr. Holmes' broad interests and experience include post-earthquake reconnaissance and analysis, post-earthquake response of hospitals, seismic protection of nonstructural systems, fragility and retrofit standards for unreinforced masonry buildings, regional loss estimation, development of seismic standards for both new and existing buildings, research and development of seismic technology, seismic isolation, public policy, and performance-based seismic engineering. Mr. Holmes has traveled to Armenia, Azerbaijan, Canada, China, Ecuador, Greece, India, Italy, Japan, Mexico, New Zealand, Pakistan, Thailand, and Turkey to address conferences and workshops or to consult with local officials on seismic design. As a result of his long and varied career, he has been awarded the Alfred E. Alquist Medal for Achievement in Earthquake Safety (Public Service) by the California Earthquake Safety Foundation, the H.J. Brunnier Award for lifetime achievement in structural engineering by the Structural Engineers Association of Northern California (SEAONC), the Exceptional Service Award by the Building Seismic Safety Council, and Honorary Membership in the Structural Engineers Association of California and the Earthquake Engineering Research Institute (EERI). He sits on the Board of Directors of Consortium of Universities for Research in Earthquake Engineering (CUREE), and has served as president of SEAONC and the Applied Technology Council. Mr. Holmes received a B.S. in civil engineering and an M.S. in structural engineering from Stanford University.

Laurie A. Johnson

Member

LAURIE A. JOHNSON is Principal of Laurie Johnson Consulting and Research. She has over 20 years of professional experience in urban planning, risk management, and disaster recovery research and consulting. She has written extensively about the economics of catastrophes, land use and risk, and urban disaster recovery and reconstruction, and researched most of the large-scale urban disasters of the past 20 years, including the 2008 Sichuan China earthquake, Hurricane Katrina, the 2001 World Trade Center collapse, and the 1994 Northridge CA and 1995 Kobe Japan earthquakes. In March 2006, she founded her consultancy, working to apply the principles and technologies of risk management to solve complex urban problems. Her clients include the California Governor's Office of Emergency Services, Fritz Institute, Greater New Orleans Community Support Foundation, and the U.S. Geological Survey. In 2006 and 2007, she was a lead author and disaster recovery expert on the development of a unified recovery and rebuilding plan for the City of New Orleans following the devastation of Hurricane Katrina. She is currently completing her Doctorate of Informatics at Kyoto University, Japan where she is also an International Research Collaborator at the Research Center for Disaster Reduction Systems at the Disaster Prevention Research Institute. She also holds a Master of Urban Planning and Bachelor of Science, Geophysics degrees, both from Texas A&M University. She is on the Board of Directors of the Public Entity Risk Institute, and a member of the Earthquake Engineering Research Institute, American Institute of Certified Planners, and the American Planning Association.

Thomas H. Jordan

Member

THOMAS H. JORDAN is director of the Southern California Earthquake Center (SCEC) and W. M. Keck Professor of Earth Sciences at the University of Southern California (USC). He oversees all aspects of SCEC's program, which currently involves over 600 scientists at more than 60 universities and research institutions. SCEC develops comprehensive understanding of earthquakes and communicates knowledge for reducing earthquake risk. Dr. Jordan is a member of the California Earthquake Prediction Evaluation Council and the NAS Council and the NRC Governing Board. His research addresses earthquake processes, seismology of the earth, and geodetic observations of plate motions and interplate deformation. His other areas of interest include continental formation and tectonic evolution, mantle dynamics, and statistical descriptions of seafloor morphology. Dr. Jordan is the author or co-author of approximately 180 scientific publications, including the NRC decadal report, *Living on an Active Earth: Perspectives on Earthquake Science*, and two popular textbooks. He taught at Princeton University and the Scripps Institution of Oceanography before joining the Massachusetts Institute of Technology (MIT) as the Robert R. Shrock Professor in 1984. He served as the head of MIT's Department of Earth, Atmospheric and Planetary Sciences for the decade 1988-1998. In 2000, he moved from MIT to USC. He has been awarded the Macelwane and Lehmann Medals of AGU and the Woollard Award of GSA. He has been elected to NAS, the American Academy of Arts and Sciences, and the American Philosophical Society. Dr. Jordan received his B.A., M.S., and Ph.D. from the California Institute of Technology.

Gary A. Kreps

Member

GARY A. KREPS is former vice provost and professor emeritus at the College of William and Mary. He began his career as a faculty member and administrator at William and Mary and continued there until retiring in July 2005. Dr. Kreps has long-standing research interests in organizational and role theories as both relate to structural analyses of community, regional, and societal responses to natural, technological, and willful hazards and disasters. He has served as a staff member, consultant, or member on five National Research Council committees: the Committee on the Socioeconomic Effects of Earthquake Prediction, the Committee on U.S. Emergency Preparedness, the Committee on International Disaster Assistance, the Committee on Mass Media Reporting of Disasters, and the Committee on Disaster Research in the Social Sciences. Over the course of the past two decades, Dr. Kreps and his collaborators have developed taxonomies and theories of organizing and role enactment during the emergency periods of disasters. Major findings from his research program have been reported in two books and articles in *Sociological Theory*, *Annual Review of Sociology*, *American Sociological Review*, *American Journal of Sociology*, *Journal of Applied Behavioral Science*, *International Journal of Mass Emergencies and Disasters*, and many other basic and applied publications. Dr. Kreps' 2001 entry in the *International Encyclopedia of the Social and Behavioral Sciences* ("Disaster, Sociology of") emphasizes the need to reconcile functionalist and constructivist conceptions of disasters as acute systemic events. Most recently, he received the 2008 E.L. Quarantelli Award for career contributions to social science theory and research on hazards and disasters. Dr. Kreps received his bachelor's degree in sociology at the University of Akron, and his master's and doctorate degrees from The Ohio State University.

Adam Z. Rose

Member

ADAM Z. ROSE is a research professor at the University of Southern California School of Policy, Planning, and Development. He is also Coordinator for Economics at USC's DHS Center for Risk and Economic Analysis of Terrorism Events. Much of Dr. Rose's research is on the economics of natural and man-made hazards. He recently served on an NRC panel on the economic benefits of seismic monitoring, as a lead researcher for a report to Congress on the net benefits of FEMA hazard mitigation grants, as lead economist on the Southern California ShakeOut Project, and as a co-PI on a project for the National Biodefense Analysis and Countermeasures Center to develop a capability to analyze the economic consequences of terrorist threats. He is currently a co-PI on an NSF grant to estimate the economic impacts of risk amplification following terrorist attacks, , and on a project to develop a hazards decision-support system for the Los Angeles Department of Water and Power. A major focus of his research has been on resilience to natural disasters and terrorism at the levels of the individual business, market, and regional economy. Dr. Rose's other research areas are the economics of energy and climate change policy. He has served on the editorial boards of the Journal of Regional Science, Resource and Energy Economics, Energy Policy, and Resource Policy. He has served as the American Economic Association Representative to the AAAS, and on the Board of Directors of the American Association of Geographers Energy and Environment Specialty Group. He is the recipient of a Woodrow Wilson Fellowship, East-West Center Fellowship, American Planning Association's Outstanding Program Planning Honor Award, EERI Special Service Recognition Award, and Applied Technology Council Outstanding Achievement Award. Dr. Rose received a B.A. in economics from the University of Utah, and an M.A. and Ph.D. in economics from Cornell University.

L. T. Tobin

Member

L. THOMAS TOBIN is a consultant with Tobin and Associates. He has worked on natural hazards, risk management, and public policy issues for 40 years. Mr. Tobin served ten years as executive director of the California Seismic Safety Commission. He has lobbied for legislation, having testified to Congressional committees on six occasions and state legislative committees on over 100 occasions. He served on the NEHRP advisory committee from 1991 to 1993 and the California State Historical Building Safety Board from 1991 to 1995. He served as a director and vice president of the EERI, was EERI's Distinguished Lecturer in 1996, and was presented the San Jose State University College of Engineering's Award of Distinction in 1996. He was the 2004 recipient of the Alfred E. Alquist Medal for Achievement in Earthquake Safety. He was the founding secretary-treasurer of EERI's northern California Chapter from 2001 through 2003, and is the current president. As a consultant, Mr. Tobin helped FEMA create both Project Impact and the Disaster Resistant University initiatives. He currently is involved in projects advocating earthquake resilience and mitigation through land use regulation and planning and by integrating seismic safety principles with his clients' ongoing activities. He is senior advisor at GeoHazards International, bringing resources and technical knowledge to developing countries to reduce earthquake risk, and vice chair of the Multihazard Mitigation Council. He is a registered professional engineer. Mr. Tobin received a B.S. in civil engineering from the University of California at Berkeley, and an M.S. in geotechnical engineering from San José State University.

Andrew S. Whittaker

Member

ANDREW S. WHITTAKER is a professor in the Department of Civil, Structural and Environmental Engineering at the University at Buffalo, State University of New York, and a licensed structural engineer in the state of California. He practiced as a structural engineer in Australia and Asia in the late 1970s and early 1980s and in the United States in the late 1980s. He served as the associate director of the Earthquake Engineering Research Center and Pacific Earthquake Engineering Research Center in the 1990s and joined the University at Buffalo in 2000. He joined the board of directors of CUREE in 2001, served as vice president in 2003-2004, and has been president since 2005. Dr. Whittaker's research and professional interests include earthquake and blast engineering, performance-based design, seismic protective systems, ultra-high-rise buildings, offshore platforms and power-related infrastructure. He is the author of more than 200 publications, including a reference text, book chapters, journal papers, conference papers, and technical reports. Dr. Whittaker led NSF-funded earthquake reconnaissance teams to Kobe, Japan, in 1995, and Izmit, Turkey, in 1999, and was a member of the 3-person, NSF-funded structural engineering reconnaissance team at the site of the former World Trade Center in September 2001. He currently serves on technical committees for American Concrete Institute, American Society of Civil Engineers (ASCE), American Institute of Steel Construction, Building Seismic Safety Council, FEMA, EERI, and USGS. Dr. Whittaker provides consulting and peer-review services to private companies, local, state, and federal government agencies in the United States, Asia, Australia, Europe, Far East, Middle East, South America, and the United Kingdom. A focus of his professional work is the application of new technologies and performance-based design to ultra-tall buildings, bridges, and conventional and nuclear-related infrastructure. He is the leader for the Structural Performance Products team that is developing the second generation of tools for performance-based earthquake engineering as part of the DHS/FEMA-funded ATC-58 (Applied Technology Council 58) project. Dr. Whittaker received a B.E. in civil engineering from the University of Melbourne, Australia, and a M.S. in civil engineering and Ph.D. in structural engineering from the University of California at Berkeley.