

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

Policy and Global Affairs Division

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April 27, 2012

Elizabeth Lemersal
External Research Support Manager
Earthquake Hazards Program
U.S. Geological Survey
905 National Center
12201 Sunrise Valley Drive
Reston, VA 20192
Tel: 703-648-6716
Email: Lemersal@usgs.gov

Re: Award # G10AP00079

Dear Dr. Lemersal:

Attached is the Final Technical Report for the study “Increasing National Resilience to Hazards and Disasters” for the award period that that extended from 03/02/2010 through 12/31/12. The report summarizes the activities of the study during the entire award period.

We are grateful to the Survey for the support of this work. We will maintain contact with your office regarding the progress with the study and the study’s final public report which will be released this year.

Sincerely,



Elizabeth A. Eide
Director, Board on Earth Sciences & Resources
Study Director

**The National Academies
Policy and Global Affairs Division
Committee on Science, Engineering, and Public Policy**

INCREASING NATIONAL RESILIENCE TO HAZARDS AND DISASTERS

**Final Technical Report
Award number G10AP00079**

This final technical report for the study on Increasing National Resilience to Hazards and Disasters through award number G10AP00079 summarizes the activities of the study during the award period that concluded on December 31, 2012.

ABSTRACT

The National Research Council (NRC) undertook this study, at the request of the U.S. Geological Survey, 7 other federal agency sponsors, and 1 research institution. The NRC and sponsors agreed to address a study charge that defined “national resilience”, provided goals, baseline conditions, or metrics for resilience, described the state of knowledge of disaster and hazard resilience, outlined data and gaps that are necessary to address to increase national resilience, and presented conclusions and recommendations on what approaches the United States could take to increase national resilience. The study completed 8 meetings, 6 of which were meetings convened by the study committee and 2 of which were coordinated by study staff only for the sponsors. Three of the committee meetings were regional visits to observe and discuss resilience in areas representing diverse geographic, climatic, and demographic parts of the country. The study issued an interim report—a workshop summary—published in June 2011 that described the activities and discussions on one of the regional site visits (a 3-day meeting on the Louisiana and Mississippi Gulf Coast). The final consensus report of the committee will be issued during the summer of 2012. The fact that the report was not completed at the close of this specific award is due to the fact that the total study duration is longer than the USGS award period because of the multiple sponsoring agencies with different contractual start and end dates. The final consensus report with attendant bibliography will be provided to the USGS upon its completion.

STUDY BACKGROUND

The National Research Council (NRC) undertook this study, at the request of the U.S. Geological Survey, 7 other federal agency sponsors and 1 research institution. The NRC and sponsors agreed to the following study charge:

Statement of Task

An ad hoc committee overseen through collaborative oversight of the Disasters Roundtable and the Committee on Science, Engineering, and Public Policy will conduct a study and issue a consensus report that integrates information from the natural, physical, technical, economic, and social sciences to identify ways in which to increase national resilience to hazards and disasters in the United States. In this context, “national resilience” includes resilience at federal, state and local community levels.

The ad-hoc committee will:

- Define “national resilience” and frame the primary issues related to increasing national resilience to hazards and disasters in the United States;
- Provide goals, baseline conditions, or performance metrics for resilience at the U.S. national level;
- Describe the state of knowledge about resilience to hazards and disasters in the United States;
- Outline additional information or data and gaps and obstacles to action that need to be addressed in order to increase resilience to hazards and disasters in the United States;
- Present conclusions and recommendations about what approaches are needed to elevate national resilience to hazards and disasters in the United States.

Scope of the Study

A broad range of topics and considerations are involved in increasing resilience to hazards and disasters at the national scale, including the integration of roles, responsibilities, and governance through the federal, state, local, and community levels. To bound the broad range of topics and produce a report with high levels of utility, the committee may opt to develop some of the study findings in the context of one or more exemplars or case studies that can provide both sufficient detail and the potential for substantive and directly applicable recommendations. The committee may present its assessments, conclusions, and recommendations in terms of the following:

- A framework for improving coordination and organization among the various entities that have roles in all phases of disasters, which could include:
 - Identifying leadership protocol;
 - Articulating the roles and responsibilities across these entities; and
 - Determining successful practices, as well as means to improve upon those practices;
- assessment of progress towards successful recovery from a disaster;
- expectations for disaster resilience; and
- crosscutting topics, such as critical infrastructure, insurance and reinsurance, and ways that hazards cascade into disasters or catastrophes.

MAJOR TASKS COMPLETED FOR THE STUDY DURING THE AWARD PERIOD

Establishing Study Committee

The project officially began in late June 2010 when the NRC had received ~70% of the total study funding from the combined sponsor group. NRC staff sought nominations to the study committee, including suggestions from the sponsors, and in late August 2010 received approval from the National Academies for the study committee. The committee members include (see Attachment 1 for committee member biographies):

Susan L. Cutter (Chair), Distinguished Professor and Director,
Hazards & Vulnerability Research Institute, University of South Carolina
Maj. Gen. Joseph A. Ahearn (Ret), Senior Vice President, CH2M HILL Ltd
Bernard Amadei, Professor of Civil Engineering, Department of Civil, Environmental &
Architectural Engineering, University of Colorado at Boulder
Patrick Crawford, Director of Disaster Services, Feeding America
Gerald E. Galloway, Jr., Glenn L. Martin Institute Professor of Engineering
University of Maryland
Michael F. Goodchild, Professor, Department of Geography,
University of California, Santa Barbara
Howard C. Kunreuther, Professor of Decision Sciences and Business & Public Policy
Wharton School of Business, University of Pennsylvania
Meredith Li-Vollmer, Risk Communication Specialist at Public Health
Seattle & King County
Monica Schoch-Spana, Senior Associate, University of Pittsburgh Medical Center
Susan Scrimshaw, President, The Sage Colleges
Ellis M. Stanley, Sr., Director of Western Emergency Management Services
Dewberry
Gene Whitney, Energy Research Manager, Congressional Research Service
Mary Lou Zoback, Research Stanford University

Public and Sponsor Meetings

The study organized six public meetings of the committee for the purposes of information gathering, and two status meetings only for the study sponsors (with just the NRC staff and sponsors present). In addition the committee has itself had several closed teleconference discussions during different stages of the study process. The public and sponsor meetings and dates are summarized briefly below. The individual monthly reports provide further details specific to each month's activities.

1. First sponsor meeting, September 9, 2010, Washington, DC. This meeting was the first meeting with all of the study sponsors gathered. The NRC staff discussed the general study timeline with the sponsors. Sponsors provided their agencies' perspectives on expectations and hopes for the study.
2. First public meeting of the committee, September 29-30, 2010, in Washington, DC. At this meeting the committee heard from the sponsors regarding their perspectives and activities related

to disaster resilience and engaged in dialogue with the sponsors and gathered audience. The committee used the time in closed session, amongst other activities, to develop their working definition of “resilience” (shared for the first time at their January 2011 public meeting) and to plan their calendar and needs for upcoming workshops. A regional approach was determined to provide the best opportunity for the committee to understand what resilience issues may be of most importance in different parts of the country. For this reason, the committee decided to have its subsequent three meetings in three distinct parts of the country: Gulf Coast; Midwest; West Coast. See Attachment 2 for meeting agenda.

3. Second public of the committee, January 18-21, 2011, on the Gulf Coast of Louisiana and Mississippi. The committee organized a field trip for their first day that took them along the Gulf Coast of Louisiana and Mississippi, including stops in New Orleans, and Waveland, Gulfport, and Biloxi, Mississippi. The second day of their meeting was a public workshop from which they heard perspectives from stakeholders in 5 panel sessions. The results from the field trip and workshop are summarized in a workshop report—an interim project deliverable—that was published for the study in June 2010: http://www.nap.edu/catalog.php?record_id=13178. The PDF is freely downloadable online. Hard copies of the report were provided to the USGS. See Attachment 3 for meeting agenda.

4. Third public meeting of the committee, March 6-9, 2011 in Cedar Rapids and Iowa City, Iowa. The committee and NRC staff used a similar framework for their Iowa meeting by organizing a field trip through Cedar Rapids and Iowa City with local guides and with several coordinated stopping points to discuss with local community representatives different aspects of the cities’ resilience to flooding and reactions to the flood of 2008. The second day of the meeting was a workshop at which the committee again heard perspectives from stakeholders in 5 panel sessions. See Attachment 4 for meeting agenda.

5. Second sponsor-only meeting, March 23, 2011, Washington, DC. The NRC staff provided a status report of the progress with the study and responded to questions from the sponsors. General discussion included agreement by the majority of sponsors that the statement of task was a good, general guide toward allowing the committee to address issues that would meet the needs and expectations of all of the agencies sponsoring the study.

6. Fourth public committee meeting, May 23-25, 2011, Irvine, California. Following in the pattern of previous regional meetings, a portion of the committee went on a field trip to the Port of Long Beach to view specific resilience issues related to critical infrastructure. The entire committee then gathered on the second meeting day for a public workshop where the committee hosted 4 panel discussion regarding resilience themes. Each theme area was addressed by different stakeholder groups. See Attachment 5 for meeting agenda. The final day of the meeting was entirely closed session during which the committee deliberated on their primary findings, conclusions, and recommendations for the study and their consensus report outline.

7. Fifth public committee meeting, July 6, 2011, by web conference. The committee sought input from a renowned expert in the science of communicating disaster and resilience information, Dr. Dennis Mileti. Dr. Mileti provided a 15-minute presentation via web conference, after which the virtual audience posed questions and engaged with him in discussion. Committee members were present; sponsors were invited and several attended via virtual means.

8. Sixth public committee meeting, September 21-23, 2011. This meeting was the final, scheduled physical meeting for the committee prior to their sending their report to external review. Designed primarily as a closed meeting to accommodate committee discussion on the draft of their report, the committee did host a brief open session on the morning of September 21. The purpose of the open session was to hear from three speakers who prepared remarks about the overarching issues from federal, state, local, and private sector perspectives about disaster resilience. Following their brief remarks, the committee engaged with them in discussion. Study sponsors were also invited to the meeting and were asked to share any final perspectives with the committee prior to the committee moving into closed session to complete main discussion on their report. See Attachment 6 for meeting agenda. The final two days of this meeting were not open to the public and were dedicated to the committee's deliberations and writing the report.

OTHER INFORMATION GATHERING

In addition to formal meetings, the committee and staff gathered information through a large variety of resources including online sources, published papers, and discussions with professionals from federal and state agencies and academia in various conferences and by telephone.

PREPARATION AND PUBLICATION OF FINAL CONSENSUS REPORT AND REPORT DISSEMINATION

At the start of the study, the committee had scheduled to complete its final consensus report in the first half of 2012 and release the report to the sponsors and public. When the timing for the report to emerge from external peer review is determined in 2012, an exact date for the release of the report, including briefing to the sponsors, will be discussed and agreed upon by all of the sponsors. The study staff and committee would like the report release and briefing to achieve maximum benefit to the sponsors.

The NRC staff is working to develop a coordinated dissemination plan for the study report, and will refine that plan with sponsor input.

Although the USGS award is now completed, we will keep the Survey aware of the sponsor briefing and public release dates and planning for these events when the consensus report has been approved for publication. We will also provide copies of the final report and derivative products when available.

OUTSTANDING ADMINISTRATIVE ISSUES

The study has not encountered any outstanding administrative issues either with the conduct of the study, the study timeline, or budget through the award period. A slight delay in submission of the report to review was noted at the close of the award period (December 2012). As of the writing of this technical report, the draft report of the committee has now been submitted to external review. A final financial report will be forthcoming from our accounting office after all costs have been processed.

BIOGRAPHICAL INFORMATION
COMMITTEE ON INCREASING NATIONAL RESILIENCE TO HAZARDS AND DISASTERS

Susan L. Cutter - (Chair)
University of South Carolina

Susan L. Cutter, Chair, is a Carolina Distinguished Professor of Geography at the University of South Carolina, and director of the university's Hazards and Vulnerability Research Institute. Her primary research interests are in the area of vulnerability/resiliency science—what makes people and the places where they live vulnerable to extreme events and how vulnerability and resilience are measured, monitored, and assessed. She has authored or edited 12 books, and more than 100 peer-reviewed articles and book chapters. Dr. Cutter has also led post-event field studies of the role of geographic information technologies in rescue and relief operations in the September 11th World Trade Center attack and studies of evacuation behavior from Three Mile Island (1979), Hurricane Floyd (1999), and the Graniteville, South Carolina, train derailment and chlorine spill (2005). She led a Hurricane Katrina post-event field team to coastal Mississippi (2006) and since then has been studying the community differences in long-term recovery of the Mississippi coast. She has provided expert testimony to Congress on hazards and vulnerability and was a member of the U.S. Army Corps of Engineers Interagency Performance Evaluation Taskforce that evaluated the social impacts of the New Orleans and Southeast Louisiana Hurricane Protection System in response to Hurricane Katrina. She has authored a Trends and Outlook report for the US Army Corps of Engineers on Natural and Human-Induced Disasters and other Factors Affecting Future Emergency Response and Hazard Management. Dr. Cutter serves on many national advisory boards and committees, including those of the National Research Council, American Association for the Advancement of Science, National Science Foundation, Natural Hazards Center, and the H. John Heinz III Center for Science, Economics, and the Environment. She is a member of the International Council for Science's Integrated Research on Disaster Risk Scientific Committee. She is also a coordinating lead author of Chapter 5 of the IPCC Special Report on "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation." Dr. Cutter serves as co-executive editor of *Environment* and is an associate editor of *Weather, Climate, and Society*. She is a fellow of the American Association for the Advancement of Science and past president of the Association of American Geographers. Dr. Cutter is currently president of the Consortium of Social Science Associations. In 2006, Dr. Cutter was the recipient of the Decade of Behavior Research Award given by a multidisciplinary consortium of more than 50 national and international scientific organizations in the social and behavioral sciences. Dr. Cutter holds the MunichRe Foundation Chair (2009-2012) on Social Vulnerability through the United Nations University-Institute for Environment and Human Security, in Bonn, Germany. She received her B.A. from California State University, Hayward, and her M.A. and Ph.D. from the University of Chicago.

Joseph A. "Bud" Ahearn
CH2M HILL

Bud Ahearn (member, National Academy of Sciences) is a recently retired senior executive at CH2M HILL, where he was an executive leader in the engineering business lines of transportation, environment, water, industrial design, and related infrastructure. During his 18-year career at CH2M HILL, he served as Vice Chairman of the Board with responsibilities for strategic planning, governmental affairs, strategic communications, and leadership development, and also served in several other capacities including Transportation Business Group President, Eastern Region Manager, Senior Vice President, Federal Programs Director, and Principal-In-Charge for two major transportation corridor projects in California. Prior to joining CH2M HILL, Mr. Ahearn had a distinguished military career spanning three decades, where he achieved the rank of Major General in the U.S. Air Force. During his 34 years with the Department of Defense,

General Ahearn was responsible for shaping financial strategy, developing budgets, and executing infrastructure programs totaling more than \$7 billion annually. As the Senior Civil Engineer for the U.S. Air Force, he directed the operational readiness and natural disaster response of U.S. Air Force combat engineers and the development and operations of all U.S. air bases around the world. Dedicated to advancing engineering education and providing sustainable systems and services in the developing countries, he is a founding sponsor and governing board director of Engineers Without Borders U.S.A. Committed to strengthening the engineering profession, he is an active Distinguished Member of the American Society of Civil Engineers (ASCE), ASCE's Industry Leaders Council (ILC), the National Academy of Engineers (NAE), and the National Academy of Construction (NAC). In addition to numerous military awards, General Ahearn received the Air Force Order of the Sword, the highest honor the Noncommissioned Officer Corps of the U.S. Air Force can bestow, the University of Notre Dame College of Engineering Honor Award for professional achievement, and the Newman Medal from the Society of American Military Engineers (SAME) for outstanding military engineering achievement in Europe. He was also recipient of the SAME Golden Eagle award for lifetime achievement and was named an Honorary Member of the American Institute of Architects.

Bernard Amadei
University of Colorado at Boulder

Bernard Amadei (member, National Academy of Engineering) is Professor of Civil Engineering at the University of Colorado at Boulder. His main research and teaching interests have initially been in rock mechanics and engineering geology. Dr. Amadei's research interests cover the topics of sustainability and international development. At the University, he directs the Mortenson Center in Engineering for Developing Communities that has an overall mission to educate globally responsible engineering students and professionals to offer sustainable and appropriate solutions to the endemic problems faced by developing communities. His research at the University of Colorado has been multidisciplinary. He has also provided consulting services to various engineering companies and organizations around the world. The Founding President of Engineers Without Borders - USA and co-founder of Engineers Without Borders-International, Dr. Amadei's goal is to promote sustainable development, appropriate technology, service learning, and system thinking in the curriculum and research of civil and environmental engineering programs at University of Colorado Boulder and other U.S. universities. He has co-authored several books and approximately 160 technical papers. Dr. Amadei is also a member of the National Academy of Engineering. He received his MaSc degree in civil engineering from the University of Toronto and his Ph.D. in civil engineering from the University of California, Berkeley.

Patrick Crawford
Feeding America

Patrick Crawford coordinates disaster preparedness and relief efforts for the Feeding America Network. His responsibilities include collaborating with national partners in the emergency management and non-profit communities to insure effective collection and distribution of donated food items following disaster. Mr. Crawford also directs internal operations during disaster by coordinating among several Feeding America Departments including Logistics, Food Sourcing, Philanthropy, Communications, and Government Relations and directly with the over 200 food banks throughout the network. Prior to joining Feeding America, Mr. Crawford served as the Director of the Midwest Region for James Lee Witt Associates (JLWA), a crisis and consequence management firm, where he led efforts in emergency preparedness, response, recovery, and mitigation and provided strategic counsel and government relations advice to mitigate future flood losses near the Mississippi and Missouri Rivers. Mr. Crawford worked for over 16 years with the Federal Emergency Management Agency (FEMA) in crisis and consequence management, including responses to floods, earthquakes, hurricanes, wildfires, and acts of terrorism. At FEMA

he worked extensively in the Gulf Region, following the catastrophic Hurricanes Katrina and Rita, and in FEMA's Region 9 (covering California, Arizona, Nevada, Hawaii, and U.S. territories in the Pacific), where he worked directly with state and local governments to build emergency response, recovery, mitigation, and preparedness capacity. Mr. Crawford served as a Captain in the U.S. Army Chemical Corps where his primary responsibility was to insure unit readiness with regard to Nuclear, Biological, and Chemical defense activities. He received his B.A. in government from the University of Notre Dame and his M.A. in education from Loyola College of Maryland.

Gerald E. Galloway, Jr.
University of Maryland, College Park

Gerald E. Galloway, Jr. (member, National Academy of Engineering) is the Glenn L. Martin Institute Professor of Engineering and an affiliate professor of Public Policy at the University of Maryland, College Park. His 38-year career in the military included positions such as commander of the Army Corps of Engineers District in Vicksburg, Mississippi, and professor and founding head of the Department of Geography and Environmental Engineering and dean of the Academic Board at the U.S. Military Academy. He was promoted to brigadier general in 1990 and retired from active duty in 1995. A civil engineer, public administrator, and geographer, Dr. Galloway's current research focuses on the development of U.S. national water policy in general and national floodplain management policy in particular. He is currently a member of the National Research Council's Water Science and Technology Board and the Disasters Roundtable. A member of the National Academy of Engineering, Dr. Galloway earned his M.S.E. at Princeton and his Ph.D. in geography (specializing in water resources) from the University of North Carolina at Chapel Hill.

Michael F. Goodchild
University of California, Santa Barbara

Michael F. Goodchild (member, National Academy of Sciences) is a professor of geography and director of the Center for Spatial Studies and Center for Spatially Integrated Social Science at the University of California, Santa Barbara. He is also chair of the Executive Committee of the National Center for Geographic Information and Analysis and associate director of the Alexandria Digital Library. He taught at the University of Western Ontario for 19 years before moving to his present position in 1988. His research interests focus on the issues of geographic information, including accuracy and the modeling of uncertainty, the design of spatial decision support systems, the development of methods of spatial analysis, and data structures for global geographic information systems. He has explored using digital information gathered by remote sensing satellites to create spatial and environmental models of the planet, make maps, and create digital libraries of geographic information that can be widely accessed electronically. He has also developed mathematical models to help quantify the difference between these geographic measurements and the reality of the world outside, so that geographic information can be accurately used. His research also includes digital libraries and problems associated with search, retrieval, and use of geographic information over the Internet; the potential for novel kinds of fieldwork enabled by fully mobile, wirelessly connected, and even wearable information technology; and the role of geographic information technologies in science and policy making. He has received several awards and published numerous books and journal articles. A member of the National Academy of Sciences, he has served on numerous National Research Council study and standing committees as both member and chair. He received a B.A. in physics from Cambridge University and a Ph.D. in geography from McMaster University.

Howard C. Kunreuther
University of Pennsylvania, Wharton School of Business

Howard Kunreuther is the Cecilia Yen Koo Professor of Decision Sciences and Public Policy at the

Wharton School, Co-Director of the Wharton Risk Management and Decision Processes Center. He has a long-standing interest in ways that society can better manage low-probability/high-consequence events related to technological and natural hazards and has published widely in these areas. Dr. Kunreuther is a Fellow of the American Association for the Advancement of Science (AAAS) and recently served as a member of the National Academy of Sciences Panel on Adaptation Strategies for Climate Change. He is a Distinguished Fellow of the Society for Risk Analysis, receiving the Society's Distinguished Achievement Award in 2001. He co-chaired the World Economic Forum's Global Agenda Council on "Innovation and Leadership in Reducing Risks from Natural Disasters" and is a member of the World Economic Forum's Global Agenda Council on Humanitarian Assistance, and the Organization for Economic Cooperation and Development's High Level Advisory Board on Financial Management of Large-Scale Catastrophes. His most recent books are *At War with the Weather* (with Erwann Michel-Kerjan) (July 2009, MIT Press), and *Learning from Catastrophes: Strategies for Reaction and Response* (with Michael Useem) (December 2009, Wharton School Publishing). He received his A.B. in economics from Bates College and his Ph.D. in economics from Massachusetts Institute of Technology.

Meredith Li-Vollmer
Public Health - Seattle & King County

Meredith Li-Vollmer is a risk communication specialist for Public Health – Seattle & King County, where she leads planning for communications during emergencies, with a particular focus on strengthening the capacity of public health to reach those most at-risk during emergencies. In this role, she conducts audience research, directs public engagement projects, and develops strategies and materials for public outreach. In 2009, she directed a CDC-funded Public Engagement Project on Medical Service Prioritization during an Influenza Pandemic and presented the findings to a workshop of the Institute of Medicine. More recently, she led a local public engagement project on H1N1 vaccine. Meredith is also a researcher with the University of Washington Preparedness & Emergency Response Research Center and a clinical assistant professor at the University of Washington School of Public Health and Community Medicine. Her work has received multiple awards, including the Model Practice Award from the National Association of City and County Health Officials (NACCHO) and the Gold Award for Excellence from the National Public Health Information Coalition. Prior to joining Public Health – Seattle & King County, Meredith taught communications at the University of Washington. She received her Ph.D. in Communication from the University of Washington.

Monica Schoch-Spana
University of Pittsburgh Medical Center

Monica Schoch-Spana, a medical anthropologist, is a Senior Associate with the Center for Biosecurity of the University of Pittsburgh Medical Center (UPMC) and an Assistant Professor in the School of Medicine Division of Infectious Diseases. The Biosecurity Center works to affect policy and practice in ways that lessen the illness, death, and civil disruption that would follow large-scale epidemics, whether they occur naturally or result from the use of a biological weapon. She has led research, education and advocacy efforts to encourage greater consideration by authorities of the general public's capacity to confront bioattacks and epidemics constructively. In 2009, she organized the national conference *Resilient American Communities: Progress in Policy and Practice*, and chaired the Resilience Research Work Group. In 2006, she oversaw the Working Group on Citizen Engagement in Health Emergency Planning, and was the principal organizer for the U.S.-Canada summit on *Disease, Disaster & Democracy – The Public's Stake in Health Emergency Planning*. In 2003, she organized the national meeting, *Leadership during Bioterrorism: The Public as an Asset, Not a Problem*, and chaired the Working Group on "Governance Dilemmas" in Bioterrorism Response that issued consensus recommendations to mayors, governors, and top health officials nationwide in 2004. For over 10 years, Schoch-Spana

has briefed numerous federal, state and local officials, as well as medical, public health, and public safety professionals on critical issues in biosecurity. National advisory roles include serving on the Steering Committee of the Disaster Roundtable of the National Research Council (NRC), the Institute of Medicine Standing Committee on Medical Readiness, and the NRC Committee to Review the Department of Homeland Security's Approach to Risk Analysis. She serves on the faculty for the National Consortium for the Study of Terrorism and Responses to Terrorism (START), a university-based center of excellence supported by the U.S. Department of Homeland Security. In 2003, Dr. Schoch-Spana helped establish the Biosecurity Center of UPMC; prior to that she worked at the Johns Hopkins Center for Civilian Biodefense Strategies starting in 1998. She received her Ph.D. in Cultural Anthropology from Johns Hopkins University and B.A. from Bryn Mawr College.

Susan C. Scrimshaw
The Sage Colleges

Susan C. Scrimshaw (member, Institute of Medicine) is Interim president of The Sage Colleges. She moved to Sage after serving as President of Simmons College. Dr. Scrimshaw was formerly dean of the University of Illinois at Chicago (UIC) School of Public Health and professor of community health sciences and anthropology at UIC. Under her leadership, the UIC School of Public Health established a wide range of community, regional, and national partnership initiatives, including addressing disparities in the delivery of health care, improving pregnancy outcomes, maternal and child health, healthy aging, violence prevention, cancer prevention, AIDS/STD prevention, and occupational and environmental health issues. While dean of the School of Public Health, she led the school in a national role in responding to the September 11 terrorist attacks. Her own interdisciplinary research has focused on gender, race, ethnicity, and culture, and their impact on public health and includes community participatory research methods, addressing health disparities, improving pregnancy outcomes, violence prevention, health literacy, and culturally appropriate delivery of health care. She has been frequently honored for her work in raising awareness of public health issues around the world, including minority populations in the United States. Her awards include a gold medal as a "Hero of Public Health" presented by the president of Mexico, and the Margaret Mead Award of the American Anthropological Association. She is the author of five books or monographs and 65 journal articles and book chapters. She is past president of the Society for Medical Anthropology, a member and past chair of the national Association of Schools of Public Health, and a member of the board of directors of the U.S.-Mexico Foundation for Science, which advocates for scientific collaboration between the two countries. She was a founding member of the task force on Community Preventive Services of the federal Centers for Disease Control and Prevention. In 2006, she was awarded the Illinois Public Health Association's highest honor, the 2006 Distinguished Service Award, in recognition of her distinguished service in research, teaching, and public health practice. She is a member of the governing council of the Institute of Medicine of the National Academies and has served on several of its panels and boards. She recently chaired the Institute of Medicine's committee on Improving the Health of Diverse Populations. Dr. Scrimshaw is a fellow of the American Association of the Advancement of Science.

Ellis M. Stanley, Sr.
Dewberry

Ellis M. Stanley, Sr. is Vice President of Western Emergency Management Services at Dewberry LLC. Prior to joining Dewberry, Mr. Stanley served as General Manager of the City of Los Angeles Emergency Preparedness Department, where he worked for 10 years. With 35 years of experience in the emergency management field, Mr. Stanley has worked at four national political conventions, the 1996 Olympic Games in Atlanta and the 1994 Papal visit and World Youth Conference in Denver. He has served as past president of the International Association of

Emergency Managers and has led delegations of emergency management professionals to China, Japan and other countries. A member of the National Research Council's Disasters Roundtable, he received his B.A. in political science from the University of North Carolina.

Gene Whitney
Congressional Research Service

Gene Whitney is Energy Research Manager for the Congressional Research Service at the Library of Congress in Washington, D.C. Previously, he was Assistant Director for Environment at the White House Office of Science and Technology Policy (OSTP). His work at OSTP focused on the science and technology policy aspects of earth sciences, natural hazards and disasters, energy, water, land remote sensing, environment, and natural resources. He served as Co-Chair of the U.S. Group on Earth Observations and was OSTP liaison to the U.S. Climate Change Science Program. He directed the Future of Land Imaging Interagency Working Group, and served as National Science Technology Council director for the Subcommittee on Disaster Reduction and the Subcommittee on Water Availability and Quality. Dr. Whitney coordinated the Federal interagency science and technology portfolio for the United States in UNESCO. He served as a member of the Joint U.S.–Canada Task Force investigating the massive electrical blackout of August 14, 2003 in the northeastern U.S. and southern Canada, and worked with the President's Council of Advisors on Science and Technology on national energy efficiency policy. Prior to OSTP Dr. Whitney was Chief Scientist for the USGS Energy Resources Team, where he managed the energy research and assessment group, conducting basic research on the geology, geochemistry, and geophysics of fossil fuels, conducting national and global assessments of oil, natural gas, and coal resources, and assessing availability and economics of fossil fuels. He has authored or co-authored numerous scientific papers and abstracts. He received an NRC postdoctoral fellowship at NASA/JPL and was awarded a senior postdoctoral fellowship at Ecole Normale Supérieure in Paris. His international experience includes working with the governments of China, Russia, Pakistan, Algeria, Bangladesh, and Japan on energy and mineral resource issues. Dr. Whitney received his Ph.D. in geology from the University of Illinois.

Mary Lou Zoback
Risk Management Solutions, Inc.

Mary Lou Zoback (member, National Academy of Sciences) is currently Vice President, Earthquake Risk Applications with Risk Management Solutions in Newark, CA. RMS is the world's leading catastrophe modeling firm. Her responsibilities at RMS include leading initiatives on the significance of risk quantification for expanding the societal role of earthquake insurance, disaster management, and risk reduction activities worldwide. She previously served as Chief Scientist of the USGS Earthquake Hazards team in Menlo Park, CA, and also as Regional Coordinator for the Northern California Earthquake Hazards Program. From 2003-2006 she was Chair of the Steering Committee for the 1906 Earthquake Centennial Alliance, a non-profit promoting public outreach on seismic safety and coordinating more than 280 groups and organizations that put on events to commemorate the 1906 earthquake. She has served on numerous national committees and panels on topics ranging from defining the next generation of Earth observations from space, storage of high-level radioactive waste, facilitating interdisciplinary research, and science education. She is a member of the National Academy of Sciences, a past-President of the Geological Society of America, a member of the Board of Directors of the Seismological Society of America, and currently serves on the National Research Council's Disasters Roundtable. She is the recipient of the 2007 GSA Day Medal, 2007 GSA Public Service Award, the "Leadership, Innovation, and Outstanding Accomplishments in Earthquake Risk Reduction" Award from the Earthquake Engineering Research Institute (2006), and the AGU Macelwane Award for Young Scientists (1987). She joined the USGS in 1978 after receiving her BS, MS and Ph.D. in geophysics from Stanford University.



Committee on Increasing National Resilience to Hazards and Disasters
Wednesday-Thursday, September 29-30, 2010
The Venable Conference Center
575 7th Street, NW, Washington, DC 20004-1601
Tel: 202 344 8181

Wednesday, September 29, The Capital Room

0800-1000 Closed session (Committee and staff only with working breakfast)

1000-1530 Open session

1000-1020 Welcome and introductions *Susan Cutter, chair*

1020-1530 Discussion with study sponsors *Susan Cutter*

Each sponsor has been asked to respond to four questions:

1. What is your agency's working definition of resilience?
2. What are your agency's expectations from this study?
3. Who are the target audiences for this study to meet those expectations?
4. What products should be produced from this study and for which audiences?

1020-1200

***Department of Homeland Security,
Human Factors/Behavioral Sciences Division*** *Michael Dunaway*

DHS/Federal Emergency Management Agency *Keith Turi*

U.S. Geological Survey *David Applegate, Paula Gori*

National Oceanic and Atmospheric Administration *Margaret Davidson, Keelin Kuipers*

Community And Regional Resilience Institute *Warren Edwards, Heather Lair*

1200-1300 Lunch

1300-1415

***Headquarters, U.S. Army Corps of Engineers,
Directorate of Contingency Operations,
International Emergency Management Program***

Andrew Bruzewicz

***Office of Electricity Delivery and Energy Reliability,
U.S. Department of Energy***

Anthony Lucas

National Aeronautics and Space Administration

Craig Dobson

Department of Agriculture Forest Service

Mike Hilbruner

1415-1430 Break

1430-1530 *General discussion*

Susan Cutter

End of open session

1545-2000 Closed session (committee and staff only)

Thursday, September 30, The East Wing Room

0800-1500 Closed session (Committee and staff only; working breakfast, lunch)

End of meeting

Please indicate your attendance to Eric Edkin (eedkin@nas.edu; 202 334 2219) by Monday, September 27th

**Preliminary agenda
Meeting of the National Research Council Committee on
Increasing National Resilience to Hazards and Disasters
January 18-21, 2011
Louisiana and Mississippi**

**Meeting base: Astor Crowne Plaza Hotel
739 Canal Street at Bourbon, New Orleans**

**Please indicate your intent to attend one or more parts of this meeting to Eric Edkin
(eedkin@nas.edu)**

Tuesday, January 18th

**Open session | "Grand A" room*, Astor Crowne Plaza Hotel | 1730-1830 hours
1730-1830 Craig Colten, Louisiana State University, Keynote presentation
"Forgetting the Unforgettable: Social Memory and Resilience in New Orleans"**

*Limited room space for this open session; please indicate your intent to attend this presentation to Eric Edkin (eedkin@nas.edu); attendance will be permitted as long as space is available

1830-1930 Committee Dinner

End of open session

Closed session | 1930-2030, Committee and NRC staff only

End of closed session

Wednesday, January 19th

Closed session | 0700-0745 hours, Committee and NRC staff only, working breakfast

End of closed session

Open session¹ | Bus | 0800-1700

0800-1130 New Orleans, guided by Pam Jenkins, University of New Orleans & Doug Meffert, Tulane University

1130-1230 Drive to Waveland, Mississippi

1230-1500 Visit stops in Waveland, Gulfport, and Biloxi, Mississippi

1500-1700 Discussion (in meeting room of a local facility in Gulfport or Biloxi)

Discussion about resilience topics with

- Alice Graham, Executive Director, Mississippi Coast Interfaith Disaster Task Force

¹ Bus is now full to capacity

- John Hosey, Disaster Behavioral Health Project Manager, Mississippi Coast Interfaith Disaster Task Force
- John Kelly, Chief Administrative Officer for the City of Gulfport
- Rupert Lacy, Director, Harrison County Emergency Management Agency
- Tom Lansford, Academic Dean and Professor, Political Science, University of Southern Mississippi, Gulf Coast
- Reilly Morse, Senior Attorney, Mississippi Center for Justice
- Kimberly Nastasi, CEO, Mississippi Gulf Coast Chamber of Commerce
- Tracie Sempier, Coastal Storms Outreach Coordinator, Mississippi-Alabama Sea Grant Consortium
- Lori West, Gulf Region Director, IRD, US Gulf Coast Community Resource Centers

End of open session

Committee return to New Orleans by bus—arrive ca. 1900 at Astor Crowne Plaza Hotel.

Thursday, January 20th
Workshop | "Toulouse A&B" room | 0715 – 1730

Closed session | "Toulouse A&B" room, Astor Crowne Plaza Hotel | 0715-0815
Committee, staff, and facilitators only; working breakfast

End of closed session

Open session | Toulouse A&B | 0830-1730

0830-0840 Welcome and introductions

**Susan Cutter,
Committee chair**

0840-0845 Senator Mary Landrieu, opening remarks (via videotape)

0845-0930 Keynote presentation

Allison Plyer, Greater New Orleans Community Data Center

"The New Orleans at Five: From Recovery to Transformation"

0940–1500 Panel sessions (5)

Facilitated by Ann Olsen, Meridian Institute

0940-1025 Business-Insurance-Real Estate panel

Julie Rochman – President and CEO, Institute for Business and Home Safety

Eric Nelson – Travelers Vice President, Personal Insurance

Ommeed Sathe -- Director of Real Estate Strategy, New Orleans Redevelopment Authority

1025-1040 Break

1040-1125 Critical Infrastructure panel

Marcia St. Martin – Executive Director, Sewerage and Water Board of New Orleans

Justin Augustine – CEO, New Orleans Regional Transit Authority and Vice President, Veolia Transportation

Greg Grillo – Entergy Corporation, Director-Transmission Project Management Construction and Incident Commander

Frank Wise – Executive Director of Network Operations, Florida, Verizon Wireless

1130-1215 Governance panel

Earthea Nance – University of New Orleans

Bill Stallworth – Executive Director/Councilman East Biloxi Coordination and Relief Center/Biloxi City Council

Stephen Murphy – Director of Planning, City of New Orleans Office of Homeland Security and Emergency Response

Charles Allen, III - Advisor to the Mayor and Director New Orleans Office of Coastal and Environmental Affairs

1215-1315 Lunch

1315-1400 Social Capital panel

Natalie Jayroe – CEO Greater New Orleans and Acadiana Food Bank

Steven Bingle – President, Concordia

Mary Claire Landry – Director, Domestic Violence Programs (Family Justice Center; Crescent House; Sexual Assault Services; and Project SAVE) Catholic Charities Archdiocese of New Orleans

Pam Jenkins – University of New Orleans

1405-1450 Healthy Populations and Responsive Institutions panel

Joseph Donchess – Executive Director, Louisiana Nursing Home Association

Knox Andress – Designated Regional Coordinator, Louisiana Region 7 Hospital Preparedness; Louisiana State University Health Sciences Center-Shreveport, Louisiana Poison Center

Anthony Speier – Deputy Assistant Secretary, Office of Behavioral Health, Louisiana

Paul Byers – Acting State Epidemiologist, Mississippi State Department of Health

1450-1510 Break

1510-1630 Breakout sessions

Committee, panelists, and audience move to one of five breakout sessions, representing each of the five panels

1630-1730 Plenary session

1900-2100 Working Committee Dinner

Bourbon House, 144 Bourbon Street, New Orleans

Conversations with guests: John M. Barry and Commissioner Mike Chaney

End of open session

Friday, January 21st

**Closed session | "St. Louis" Room | 0800 – 1400
Committee and NRC staff only**

End of closed session and end of meeting

Agenda

Meeting of the Committee on Increasing National Resilience To Hazards and Disasters
March 6-9, 2011
Cedar Rapids and Iowa City, IA

**Meeting base: The Hotel at Kirkwood Center
7725 Kirkwood Blvd. SW, Cedar Rapids, Iowa
319-848-8700**

Committee's working definition of resilience:

Ability to prepare/plan for, absorb, recover from or more successfully adapt to actual or potential adverse events

If interested to attend the open session on the afternoon of March 7 at the University of Iowa (Iowa City) or the workshop on March 8 at the Kirkwood Center (Cedar Rapids), please contact Eric Edkin, eedkin@nas.edu

Monday, March 7th

Field Tour, Cedar Rapids | 0630 – 1200

Tour and panel discussions, University of Iowa | 1300 - 1700

Closed session / Committee and staff only | 0630-0700

Open session¹ / Bus

0730-1200

Cedar Rapids, guided by:

Christine Butterfield, *Director, Community Development, City of Cedar Rapids*

Adam Lindenlaub, *Long-range Planning Coordinator, Corridor MPO, Cedar Rapids' Community Development Department*

Dave Elgin, *Director of Public Works, City of Cedar Rapids*

(1) **0730-0850:** Visit West Cedar Rapids

0730-0745: Drive from hotel to West Cedar Rapids; stop at Block by Block headquarters.

0745-0810: Discussion, background, tour in headquarters

(<http://www.blockbyblockcr.org/>)

0810-0845: Circle through the neighborhood with Block by Block representatives on the bus to explain different parts of the neighborhood—that have been affected by flooding and have been rebuilt. Return to Block by Block to drop off staff.

0850-0905: Drive over bridge to East Cedar Rapids—pointing out the government buildings sitting in the middle of the island in the river (and attendant affects to govt buildings and operations during flood).

(2) **0905-1200:** Visit East Cedar Rapids

0905-0945: Visit African-American Museum; very independent and self-sufficient; moved own exhibits after flood. <http://www.blackiowa.org/>

Contact : *Tom Moore, Museum Executive Director*

¹ Limited bus space; please contact Eric Edkin, eedkin@nas.edu to check availability

1000-1100: Mercy hospital: hospital flooded and evacuated; talk to staff about health effects, emergency procedures, and infrastructure issues. Use Lundy Pavillion Entrance off of 8th Avenue. <http://www.mercycare.org/>

Contact: Chad Ware, Assistant Director of Inpatient Services

In addition, committee will speak with Anne Strellner from St. Lukes Hospital, Julie Stephens from Linn County Public Health, and Mike Goldberg from Linn County EMA

1100-1200: Small business/downtown commerce and properties.

<http://www.downtowncr.org/>

Contact: Doug Neumann, President/CEO of the Downtown District

Additional participants from business community with include:

-Drew Skogman (Skogman Realty)

-Steve Dummermuth (Downtown landowner)

1200-1240 *Drive to Iowa City and University of Iowa, box lunch on the bus; see several sites on campus on the drive into the Flood Center*

1240-1300 Meet Dr. Larry Weber, Director of IIHR-Hydroscience & Engineering and co-organizer of the Iowa Flood Center, at C. Maxwell Stanley Hydraulics Laboratory. Larry also co-chaired the UI flood mitigation committee. Tour through campus. Larry will accompany group into their meeting room and present a 15-20 minute overview of the 2008 flood on campus.

<http://www.iowafloodcenter.org/>

1300-1315 Disembark, get settled in the meeting room

1315-1700 *Discussion with university faculty and students at Iowa Memorial Union Building, University of Iowa campus*

1315-1330 Opening remarks and slideshow of the immediate effects of the flood on campus
Larry Weber

1330-1335 Introductions to study and committee

*Susan Cutter,
Committee chair*

1335-1515 University faculty/research panel discussion
Moderated by Gerry Galloway, Committee member
Facilitated discussion with 11 university faculty

- **Jerry Anthony**, School of Urban and Regional Planning
- **Witold Krajewski**, Department of Civil & Environmental Engineering and Director of the Iowa Flood Center
- **Kevin Leicht**, Department of Sociology
- **Alan Macvey**, Theatre Arts Department
- **Marizen Ramirez**, Department of Occupational and Environmental Health
- **John Beldon Scott**, School of Art and Art History
- **Kathleen Stewart**, Department of Geography
- **Peter Thorne**, Department of Occupational and Environmental Health
- **James Throgmorton**, School of Urban and Regional Planning
- **Larry Weber**, Department of Civil & Environmental Engineering and Director of IIHR—Hydroscience & Engineering
- **Michael Wichman**, State Hygienic Laboratory

1515-1530 *Break—light refreshments*

- 1530-1700** Student panel discussion
Moderated by Meredith Li-Vollmer, Committee member
Facilitated discussion with 8-12 students, undergraduate and graduate, from University of Iowa (UI) and University of Northern Iowa (UNI)
- **Luciana Cunha**, Civil & Environmental Engineering (UI)
 - **Emily White**, Geography (UI)
 - **Achilleas Tsakiris**, Civil & Environmental Engineering (UI)
 - **Kimberly Hoppe**, Occupational and Environmental Health (UI)
 - **Maria Elisa Mandarin de Lacerda**, Theater Arts (UI)
 - **Amy Costliow**, School of Health, Physical Education and Leisure Services (UNI)
 - **Kari Dirksen**, School of Health, Physical Education and Leisure Services (UNI)

End of open session

Tuesday, March 8th

Workshop | Ballroom B&C, Hotel at Kirkwood Center | 0830 – 1630

Open session | 0830-1630

Public welcome to attend

0800-0830 Doors open, registration

0830-0840 Introductions Susan Cutter,
Committee chair

0840-0910 Opening remarks
Mayor Ron Corbett, Cedar Rapids
Jeff Pomeranz, City Manager, Cedar Rapids

0915–1530 Panel sessions

0915-1025 Private sector
Terri Vaughan – CEO, National Association of Insurance Commissioners
Jeff McClaran – Vice President, Incident Management, Central and Gulf States, Wells Fargo
Dee Brown – Director, Energy Delivery Operations Support, Alliant Energy

Moderated by: Howard Kunreuther, Committee member

1025-1040 Break

1040-1150 Government
Patty Judge – PJJ Solutions, Inc. (Former Lt. Governor of Iowa)
Kamyar Enshayan – Cedar Falls City Council; Professor, University of Northern Iowa
Chuck Wieneke – City of Cedar Rapids City Council

Christine Butterfield –Community Development Director, City of Cedar Rapids

Moderated by: Gene Whitney, Committee member

1150-1250 Lunch – Ballroom D&E

1250-1400 First and second responders

Lt. General Ron Dardis – former Rebuild Iowa Office Executive Director and former Adjutant General of the Iowa National Guard

Clark Christensen – Logistics Officer, Public Health Response Team Coordinator, & State Coordinator for the Medical Reserve Corps, Iowa Department of Public Health, Center for Disaster Operations and Response

David Miller – Private consultant; former Administrator, Iowa Homeland Security and Emergency Management Division

Rick Wulfekuhle – Emergency Manager, Buchanan County

Mark English – Assistant Fire Chief, Cedar Rapids Fire Department

Moderated by: Patrick Crawford, Committee member

1400-1510 Community representatives

Donna Harvey – Director, Iowa Department on Aging

Nancy Beers – Director of Disaster Services and Camp Noah Lutheran Social Service

Mitch Finn – Deputy Executive Director, Hawkeye Community Action Program

Bill Gardam – President and CEO, Horizons, A Family Service Alliance

Cindy Kaestner – Vice President/Executive Director, Abbe Center for Community Mental Health

Moderated by: Susan Scrimshaw, Committee member

1510-1525 Break

1530-1630 Plenary session

Facilitated by Susan Cutter, Committee chair

End of open session

**The National Academies Committee on
Increasing National Resilience to Hazards and Disasters
Meeting
Tuesday-Thursday, May 24-26, 2011
Beckman Center of the National Academies
100 Academy Way
Irvine, California**

Tuesday, May 24: Workshop (open to the public)

Wednesday-Thursday, May 25-26: Closed meeting (Committee and staff only)

PUBLIC AGENDA

Tuesday, May 24, Huntingdon Room, Beckman Center (all times are Pacific times)

To register to attend this meeting, please contact Eric Edkin (eedkin@nas.edu)

0715-0815 *Closed session (Committee and staff only)*

Open session (open to the public): 0815 – 1630 hours

0815-0830 Welcome – Susan Cutter, Chair

0830-0930 *Keynote address:*

Laurie Johnson, Principal, Laurie Johnson Consulting | Research

0930-1045 **Panel 1: Infrastructure and economic recovery**

Moderated by Mary Lou Zoback, Committee member

John Holmes, Deputy Executive Director of Port Operations for the Port of Los Angeles

Chris Poland, Chairman, CEO, and Senior Principal, Degenkolb Engineers

Ezra Rapport, Executive Director of the Association of Bay Area Governments

Michael Morel, Manager of Operations and Planning for the Metropolitan Water District

1045-1100 *Break*

1100-1215 **Panel 2: Risk communication and resilience indicators**

Moderated by Monica Schoch-Spana, Committee member

Roxane Silver, School of Social Ecology, University of California, Irvine

Sarah Karlinsky, Deputy Director of San Francisco Planning + Urban Research Association (SPUR)

Baruch Fischhoff, Departments of Social and Decision Sciences and of Engineering and Public Policy, Carnegie Mellon University

1215-1300 Lunch

1300-1415 Panel 3: Disaster communication and impacts

Moderated by Meredith Li-Vollmer, Committee member

Lucy Jones, Chief Scientist for the Multi Hazards Initiative in Southern California, U.S. Geological Survey

Mariana Amatullo, Vice President, Designmatters at Art Center College of Design

Barbara Andersen, Strategic Partnerships Director, Orfalea Foundations

David Eisenman, UCLA Division of General Internal Medicine and Health Services Research

1415-1530 Panel 4: IT/social media and disaster resilience

Moderated by Michael Goodchild, Committee member

Leysia Palen, Department of Computer Science, University of Colorado at Boulder

Matt Zook, Department of Geography, University of Kentucky

Alan Glennon, Department of Geography, University of California, Santa Barbara

Nalini Venkatasubramanian, Department of Computer Science, University of California at Irvine

1530-1540 Break

1540-1630 Plenary session—all participants welcome

End of public meeting

1700-2000 Closed session (Committee and staff only)

Wednesday-Thursday, May 25-26, Beckman Center

Closed meeting (Committee and staff only)

**The National Academies Committee on
Increasing National Resilience to Hazards and Disasters
Meeting
Wednesday-Friday, September 21-23, 2011
Keck Center of the National Academies
500 5th Street NW
Washington, DC 20024**

PUBLIC AGENDA

Wednesday, September 21, Keck 101

To register to attend this meeting, please contact Eric Edkin (eedkin@nas.edu)

0800-0930 *Closed session (Committee and staff only)*

Open session (open to the public): 1000 – 1300 hours

1000-1010 Welcome – Susan Cutter, Chair

1010-1030 **Paul Brenner**, Senior Vice President, ICF International

1030-1050 **Claire Rubin**, Claire Rubin & Associates

1050-1130 Committee and speaker discussion

1130-1200 Open discussion among committee, speakers and audience

1200-1300 Lunch

1300-1320 **Ben Billings**, Senior Policy Adviser for Homeland Security and Disaster Recovery, Office of Senator Mary Landrieu

1320-1345 Open discussion

End of open session

1400-2000 Closed session (Committee and staff only)

Thursday and Friday, September 22-23

Closed meeting (Committee and staff only)