

DRC

Disaster Research Center

UNIVERSITY OF DELAWARE



2006 ANNUAL REPORT

DISASTER RESEARCH CENTER

**COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF SOCIOLOGY & CRIMINAL JUSTICE**

UNIVERSITY OF DELAWARE

2006 ANNUAL REPORT

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Disaster Research Center (DRC)

Established at the Ohio State University in 1963 by Professors E.L. Quarantelli, Russell Dynes, and Eugene Haas, the Disaster Research Center moved to the University of Delaware in 1985. In summer, 2006, DRC Director Professor Havidán Rodríguez became the University's Vice Provost for Academic Affairs and International Programs, and Professor Joanne Nigg stepped in as Interim Director for the remainder of the 2006–2007 academic year. DRC also became a Center within the College of Arts and Sciences this year.

DRC was the first social science research center in the world devoted to the study of disasters. The Center conducts field and survey research on group, organizational and community preparation for, response to, and recovery from natural and technological disasters and other community-wide crises. DRC has conducted basic research in sociology as well as applied studies that have been implemented in policies, programs, planning, and management in the field of disasters.

Graduate and undergraduate training has been an integral component of DRC's mission. Faculty members from the University of Delaware's Department of Sociology and Criminal Justice oversee DRC projects and teach classes in the department's graduate concentration in collective behavior, social movements, and disasters, as well as the newly formalized undergraduate concentration in Emergency and Environmental Management. Graduate researchers from DRC have gone on to careers at leading universities, prominent research centers, key disaster-oriented government agencies, and private sector organizations that deal with disaster and risk issues.

Researchers at DRC have conducted nearly 600 field studies since the Center's inception, traveling to communities throughout the United States and to a number of foreign countries. DRC researchers have carried out systematic studies on a broad range of disaster types, including tsunamis, hurricanes, floods, earthquakes, tornadoes, hazardous chemical incidents, plane crashes, and civil disturbances. Past DRC studies have focused on such topics as emergency medical and mental health service delivery in disasters, community responses to acute chemical hazards, mass evacuation and sheltering, preparations for and responses to major community disasters by lifeline organizations, community earthquake mitigation and emergency preparedness, disaster recovery, a large-scale multi-year study on the implementation of the FEMA's Project Impact initiative, and the utilization of earth science information in earthquake risk decision-making.

DRC is currently engaged in a number of research projects, including: a study of the organizational response to the September 11, 2001 World Trade Center (WTC) disaster; a collaborative and multi-disciplinary project focusing on emergency weather warnings, the development of new technologies, and their relationship to disaster preparedness and response; a collaborative project with engineers and computer scientists at the University of Rhode Island focusing on the development of a model and prototype software for the simulation of pedestrian motion, both during emergency situations that result

in evacuations and during situations devoid of emergencies; population composition, geographic distribution, natural hazards, and vulnerability in the coastal regions of Puerto Rico; socio-economic impacts of earthquakes and hurricanes in the United States; a detailed analysis of urban search and rescue teams and their operations and response to hazard events; an examination of the concepts of improvisation and sensemaking within the context of the World Trade Center attack; and a study of supply chain characterizations in the aftermath of Hurricane Katrina. Additional details on these projects can be found in this report. It is important to note that DRC is also an active collaborator in the Engineering Research Center (ERC) for the Collaborative Adaptive Sensing of the Atmosphere (CASA) and the Mid-America Earthquake Center (MAE).

In addition to maintaining its own databases, DRC serves as a repository for materials collected by other agencies and researchers. DRC's specialized library, which contains the world's most complete collection on the social and behavioral aspects of disasters — now numbering more than 55,000 items — is open to both interested scholars and agencies involved in emergency management. The Center has its own book, monograph, and report series with over 400 publications. DRC maintains ongoing contact with scholars from throughout the United States, Asia, Europe, and Mexico, some of whom have been visiting research associates at the Center for periods of up to a year. In recent years, DRC has also organized several multinational research conferences focusing on disaster issues in Central America, Southern Asia, Europe, Japan, and Russia and the former Soviet Union.

Since its founding over four decades ago, DRC activities have been supported by diverse sources, including the National Institute of Mental Health, the Federal Emergency Management Agency and its preceding agencies, the NOAA Sea Grant Program, the U.S. Geological Survey, and the Multidisciplinary Center for Earthquake Engineering Research (MCEER). Major research funding is currently provided by grants from the National Science Foundation, the Public Entity Risk Institute (PERI), and the Sea Grant College Program at the University of Puerto Rico.

For more information, consult DRC's home page at: <http://www.udel.edu/DRC>

2006 Publications

Articles and Book Chapters

Barnshaw, John

“Beyond Disaster: Locating Hurricane Katrina within an Inequality Context.” Pp. 47–70 in *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*. Boulder, CO: Institute of Behavioral Science, University of Colorado at Boulder, 2006.

Barsky, Lauren E.

“Disaster Realities Following Katrina: Revisiting the Looting Myth.” Pp. 215–234 in *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*. Boulder, CO: Institute of Behavioral Science, University of Colorado at Boulder, 2006.

Buck, Richard A., Joseph E. Trainor, and Benigno E. Aguirre

“A Critical Evaluation of the Incident Command System and NIMS.” *Journal of Homeland Security and Emergency Management*, Vol. 3, No. 3, Article 1.

Dynes, Russell R.

“Panic and the Vision of Collective Incompetence.” *Natural Hazards Observer*, Vol. 31, No. 2, pp. 5–6.

“Social Capital: Dealing with Community Emergencies.” *Homeland Security Affairs*, Vol. 2, No. 2, <http://www.hsaj.org>.

Kendra, James M. and Tricia Wachtendorf

“Community Innovation and Disasters.” Pp. 316–334 in Havidàn Rodríguez, Enrico L. Quarantelli, and Russell R. Dynes (eds.) *Handbook of Disaster Research*. New York: Springer, 2006.

Macias, Jesús Manuel and Benigno E. Aguirre

“A Critical Evaluation of the United Nations Volcanic Emergency Management System: Evidence from Latin America.” *Journal of International Affairs*, Vol. 59, No. 2, pp. 43–61.

Nigg, Joanne M., John Barnshaw, and Manuel R. Torres

“Hurricane Katrina and the Flooding of New Orleans: Emergent Issues in Sheltering and Temporary Housing.” *Shelter from the Storm: Repairing the National Emergency Management System after Hurricane Katrina*, special issue of *The Annals of the American Academy of Political and Social Science*, Vol. 604, pp. 113–128.

Poteyeva, Margarita, Megan Denver, Lauren E. Barsky, and Benigno E. Aguirre

“Search and Rescue Activities in Disasters.” Pp. 200–216 in Havidàn Rodríguez, Enrico L. Quarantelli, and Russell R. Dynes (eds.) *Handbook of Disaster Research*. New York: Springer, 2006.

Quarantelli, E. L., Patrick Lagadec, and Arjen Boin

“A Heuristic Approach to Future Disasters and Crises: New, Old, and In-Between Types.” Pp. 16–41 in Havidàn Rodríguez, Enrico L. Quarantelli, and Russell R. Dynes (eds.) *Handbook of Disaster Research*. New York: Springer, 2006.

Rodríguez, Havidàn and Benigno E. Aguirre

“Hurricane Katrina and the Healthcare Infrastructure: A Focus on Disaster Preparedness, Response, and Resiliency.” *Frontiers of Health Services Management*, Vol. 23, No. 1, pp. 13–24.

Rodríguez, Havidàn and John Barnshaw

“The Social Construction of Disasters: From Heat Waves to Worst-Case Scenarios.” *Contemporary Sociology*, Vol. 35, No. 3, pp. 218–223.

Rodríguez, Havidàn, Walter Díaz, Jenniffer M. Santos, and Benigno E. Aguirre

“Communicating Risk and Uncertainty: Science, Technology, and Disasters at the Crossroads.” Pp. 476–488 in Havidàn Rodríguez, Enrico L. Quarantelli, and Russell R. Dynes (eds.) *Handbook of Disaster Research*. New York: Springer, 2006.

Rodríguez, Havidàn and Daniel Marks

“Disasters, Vulnerability, and Governmental Response: Where (How) Have We Gone So Wrong?” *Corporate Finance Review*, Vol. 10, No. 6, pp. 5-14.

Rodríguez, Havidàn, Enrico (Henry) L. Quarantelli, and Russell (Russ) R. Dynes

“Editors’ Introduction.” Pp. xiii-xx in Havidàn Rodríguez, Enrico L. Quarantelli, and Russell R. Dynes (eds.) *Handbook of Disaster Research*. New York: Springer, 2006.

Rodríguez, Havidàn and Carla N. Russell

“Understanding Disasters: Vulnerability, Sustainable Development, and Resiliency.” Pp. 193-211 in Judith Blau and Keri Iyall Smith (eds.) *Public Sociologies Reader*. New York: Rowman & Littlefield, 2006.

Rodríguez, Havidàn, Joseph Trainor, and Enrico L. Quarantelli

“Rising to the Challenges of a Catastrophe: The Emergent and Prosocial Behavior following Hurricane Katrina.” *Shelter from the Storm: Repairing the National Emergency Management System after Hurricane Katrina*, special issue of *The Annals of the American Academy of Political and Social Science*, Vol. 604, pp. 82-101.

Rodríguez, Havidàn, Tricia Wachtendorf, James Kendra, and Joseph Trainor

“A Snapshot of the 2004 Indian Ocean Tsunami: Societal Impacts and Consequences.” *Disaster Prevention and Management*, Vol. 15, No. 1, pp. 163-177.

Santos-Hernandez, Jenniffer M.

“‘Losing Everything:’ Undocumented Latino Workers and Hurricane Katrina.” Pp. 131-150 in *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*. Boulder, CO: Institute of Behavioral Science, University of Colorado at Boulder, 2006.

Trainor, Joseph E., William Donner, and Manuel R. Torres

“There for the Storm: Warning, Response, and Rescue Among Nonevacuees.”
Pp. 307–326 in *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*. Boulder, CO: Institute of Behavioral Science, University of Colorado at Boulder, 2006.

New Preliminary Papers

Aguirre, B. E.

“On the Concept of Resilience.” Preliminary Paper No. 356.

Denver, Megan, Jaime Perez, and B. E. Aguirre

“Local Search and Rescue Teams in the United States.” Preliminary Paper No. 352.

Donner, William R.

“The Political Ecology of Disaster: An Analysis of Factors Influencing U.S. Tornado Fatalities and Injuries, 1998–2000.” Preliminary Paper No. 351.

Kendra, James and Tricia Wachtendorf

“The Waterborne Evacuation of Lower Manhattan on September 11: A Case of Distributed Sensemaking.” Preliminary Paper No. 355.

“Improvisation, Creativity, and the Art of Emergency Management.” Preliminary Paper No. 357.

Marks, Daniel E.

“Digital Inequality and the Implementation of New Technologies: Problems with Technological Diffusion among Oklahoma Emergency Managers.” Preliminary Paper No. 354.

Quarantelli, E. L.

“The Disasters of the 21st Century: A Mixture of New, Old, and Mixed Types.” Preliminary Paper No. 353.

Other Publications

Barsky, Lauren, Joseph Trainor, and Manuel Torres

Disaster Realities in the Aftermath of Hurricane Katrina: Revisiting the Looting Myth. Natural Hazards Center Quick Response Report Number 184, February, 2006. Boulder, Colorado: Natural Hazards Center, University of Colorado at Boulder. Miscellaneous Report No. 53.

Rodríguez, Havidàn, Enrico L. Quarantelli, and Russell R. Dynes

Handbook of Disaster Research (editors). New York: Springer. Book and Monograph No. 34.



Slidell, Louisiana (September, 2005) — Manuel Torres (DRC), Lauren Barsky (DRC), and Bill Donner (DRC) interview a gentleman providing aid to victims of Hurricane Katrina.

(photo by DRC staff)

Master's Theses

Torres, Manuel Roberto

“Privilege and 9/11: Risk Perception, Terrorist Acts and the White Male Effect.”
Department of Sociology and Criminal Justice and Disaster Research Center,
University of Delaware, Newark, Delaware.

Wasileski, Gabriela

“Labor Law Transformation and the Rule of Law: The Czech and Slovak Republics,
1993–2005.” Department of Sociology and Criminal Justice and Disaster Research
Center, University of Delaware, Newark, Delaware.



India (January, 2005) — Field Team Meeting with a group of Women in
India.

(photo by DRC staff)

Presentations at Professional / Scientific Conferences

Aguirre, Benigno

“Vulnerability and Resilience to Disasters in Cuba.” Presented at William Paterson University, Wayne, New Jersey, April 6, 2006.

“Final Remarks.” Presented as part of the Panel: *Prospects for Democracy in Central America*, Conference on Central America: Repression, Resistance, Recovery, University of Delaware, Newark, Delaware, May 2, 2006.

“On the Concept of Resilience.” Presented at *The Dynamics of Societal Resilience Small Group Meeting*, Australian Government, Department of Defence, Defence Science and Technology Organisation, University House, Australian National University, Canberra, Australia, May 22-23, 2006.

“Political Exile as Cultural Trauma.” Presented at the Annual Meeting of the Association for the Study of the Cuban Economy, Miami, Florida, August 4, 2006.

Aguirre, Benigno, Richard Buck, and Joseph Trainor

“Finding the Incident to Which Incident Command is the Solution.” Presented at the *Conference on Mental Health Consequences of Recent Disasters: From Oklahoma City to Katrina*, Health Science Center, University of Texas, San Antonio, Texas, September, 2006.

Barnshaw, John

“Beyond Disaster: Locating Hurricane Katrina within an Inequality Context.” Presented at the Annual Meeting of the American Sociological Association (ASA), Montreal, Quebec, Canada, August 11-14, 2006.

Barnshaw, John, Paul Dickman, and Åsa Odenbro

“Avian Pandemic Influenza: Models and Sociological Application.” Presented at the 76th Annual Meeting of Eastern Sociological Society, February 24, Boston, Massachusetts, February 24, 2006.

Barnshaw, John and Lauren Ross

“The Color of Politics and Poverty in the Aftermath of Hurricane Katrina.” Presented at the 31st Annual Hazards Research and Applications Workshop, University of Colorado at Boulder, Boulder, Colorado, July 9-12, 2006.

Barnshaw, John, and Manuel R. Torres

“Religion is the Explanation of the People: Emerging Religious Themes in the Aftermath of Hurricane Katrina.” Presented at the Annual Meeting of the Eastern Sociological Society, Boston, Massachusetts, February 24, 2006.

Barnshaw, John, Manuel R. Torres, and Lauren Ross

“Hurricane Katrina: A Disaster Forty Years in the Making.” Presented at the 36th Annual Conference, Association of Black Sociologists, Montreal, Quebec, Canada, August 9, 2006.

Barnshaw, John and Joseph Trainor

“Race, Class and Capital Amidst the Hurricane Katrina Diaspora.” Presented at the 69th Annual Southern Sociological Society Annual Meeting, New Orleans, Louisiana, March 24, 2006.

Barsky, Lauren

“Who Makes Claims about Looting?: The Role of the Mass Media in Perpetrating Disaster Myths.” Presented at the Annual Meeting of the Eastern Sociological Society, Boston, Massachusetts, February 25, 2006.

“Looting in the Media: A Comparison of Print News Media Reports during Hurricanes Frances, Ivan and Jeanne.” Presented at the Annual Meeting of the Society for the Study of Social Problems, Montreal, Quebec, Canada, August 10, 2006.

Barsky, Lauren and Michelle Moses

“The Research Experience for Undergraduates (REU) Program: Training the Next Generation of Disaster Researchers.” Presented at the 31st Annual Hazards Research and Applications Workshop, University of Colorado at Boulder, Boulder, Colorado, July 9, 2006.

Brown, Bethany

“Characterization of the Supply Chains in the Aftermath of Katrina: Logistical Issues and Lessons from an Integrated Social Sciences-Engineering Perspective.” Presented at the Katrina Research Symposium: *Social Science Research of the Katrina Aftermath*, New Orleans, Louisiana, November 3–4, 2006.

Brown, Bethany (continued)

“Communicating Convergence: Contending with Supplies Following Hurricane Katrina.” Presented at the Katrina Research Symposium: *Social Science Research of the Katrina Aftermath*, New Orleans, Louisiana, November 3–4, 2006.

“Hurricane Katrina and Domestic Violence Shelters: An Organizational Analysis.” Presented as part of the Women’s Studies Fall Lecture Series, University of Delaware, Newark, Delaware, November 15, 2006.

Donner, William

“Public Warning Response Following the February 2, 2006, Tornado Outbreak in New Orleans: An Overview of Findings.” Presented at the National Science Foundation (NSF) site visit, Collaborative Adaptive Sensing of the Environment (CASA). University of Massachusetts-Amherst, Amherst, Massachusetts, April 24, 2006.

“Public Warning Response to Hurricane Katrina: A Preliminary Analysis.” Presented at the Annual Meeting of the American Sociological Association (ASA), Montreal, Quebec, Canada, August 11–14, 2006.

Dynes, Russell R.

“Finding Order in Disorder.” Keynote address presented at the Conference on Ethics in Disaster, Evangelische Akademie Arnoldsheim, Germany, April 6, 2006. Also presented at the German-American Institute, Heidelberg, Germany, April 10, 2006.

El-Tawil, Sherif, Kapil Khandelwal, Eun-Jin Lee, Benigno Aguirre, and Rita Poteyeva

“Engineering and Social Dimensions of Victim Location and Behavior in Collapsed Structures.” Presented at the 100th Anniversary Earthquake Conference Commemorating the 1906 Earthquake, San Francisco, California, April 18–22, 2006.

Holguin-Veras, Jose, Noel Perez, Satish Ukkusuri, Tricia Wachtendorf, and Bethany Brown

“Characterization of the Supply Chains in the Aftermath of Katrina: Logistical Issues and Lessons From and Integrated Social Sciences-Engineering Perspective.” Presented at the National Science Foundation’s Human and Social Dynamics Principal Investigators Meeting, Washington, D.C., September 14–15, 2006. Also presented at the Katrina Research Symposium: *Social Science Research of the Katrina Aftermath*, New Orleans, Louisiana, November 3, 2006.

Kendra, James M., and Tricia Wachtendorf

“Improvisation and the Art of Emergency Management.” Presented at the NATO Advanced Research Workshop on *Understanding and Responding to Terrorism: A Multi-Dimensional Approach*, Sponsored by NATO and the Turkish National Police/Turkish Institute for Police Studies at the University of North Texas, Washington, D.C., September 8–9, 2006.

Letukas, Lynn

“Hurricane Katrina: Lessons Learned.” Presented at the 69th Annual Southern Sociological Society Annual Meeting, New Orleans, Louisiana, March 24, 2006.

“Comparative Analysis of the Media’s Portrayal of Indian Ocean Tsunami Response.” Presented at the Student Research Conference, Millersville University, Millersville, Pennsylvania, March 31, 2006.

Nigg, Joanne

“Higher Education and the Emergency Manager of the 21st Century.” Presentation at the Department of Homeland Security Higher Education Conference, Lebanon, Indiana, April 7–8, 2006.

“Creating Disaster Resilient Communities.” Invited keynote address at the Fulbright Alumni Association of Trinidad and Tobago Conference on Involving Communities in Disaster Risk Management: A Call to Action, Port of Spain, Trinidad, September 12, 2006.

“Resilient Communities and their Infrastructural Systems: Social, Built, and Ecological.” Invited presentation to the National Academy of Sciences and Engineering’s Colloquium on Critical Infrastructures and Disaster-Resilient Communities, Washington, DC, September 27, 2006.

Nigg, Joanne (continued)

“Meeting Disaster Challenges: Planning for Resilience and Reducing Vulnerability.” Presentation at the Delaware/Maryland American Planning Association Annual Conference, Wilmington, Delaware, October 6, 2006.

Quarantelli, E. L.

“Trans-system Ruptures: The New Disasters of the 21st Century.” Presented at the Third Annual Magrann Research Conference on *The Future of Disasters in a Globalizing World*, Rutgers University, New Brunswick, New Jersey, April 22, 2006.

Rodríguez, Havidàn

“Disaster and Emergency Preparedness.” Presented at the 6th Annual Anton Lippitt Conference on Urban Affairs, Brown University, Providence, Rhode Island, February 10, 2006.

“Technology, Disasters, and Public Response: Understanding the Complexities of Risk Communication.” Presented to the Computer Science and Telecommunications Board Committee on Using Information Technology to Enhance Disaster Management, National Academies of Science, Keck Center, Washington, D.C., May 1, 2006.

“Latinos/as: Changing the Face of America.” Keynote Speaker at the *Latino Students of Distinction Celebration*. University of Delaware, Newark, Delaware, May 6, 2006.

“From the Indian Ocean Tsunami to Katrina: The Social Construction of Disasters and Catastrophes.” *Annual Faculty Lecture*, University of Delaware Morris Library, Newark, Delaware, June 1, 2006.

“Hazards, Vulnerability and Human Rights: Developing Disaster Resilient Communities.” Presented at the *Sociologists without Borders* Session, International Sociological Association (ISA), Durban, South Africa, July 25, 2006.

“Emergent Behavior, Resiliency, and Hurricane Katrina: An In-depth Focus on the Healthcare System.” Presented at the *Research Committee on Disaster* Session, International Sociological Association, Durban, South Africa, July 25, 2006.

“Disasters are Not Natural: The Role of Population, Development, and Public Policy.” Presented at the *Freshman Family Weekend, Back to Class Lectures*, University of Delaware, September 16, 2006.

Rodríguez, Havidàn (continued)

“What is a “Hispanic”?: Identity Politics among Latinos/as in the U.S.” Presented at the *Identity Construction among U.S. Latinas and Latinos* Forum, University of Delaware, Newark, Delaware, October 24, 2006.

Rodríguez, Havidàn and Benigno Aguirre

“The Impact of Hurricane Katrina on the Medical and Healthcare Infrastructure: A Focus on Disaster Preparedness, Response, and Resiliency.” Presented at *The Dynamics of Societal Resilience Small Group Meeting*, Australian Government, Department of Defence, Defence Science and Technology Organisation, University House, Australian National University, Canberra, Australia, May 22–23, 2006.

Rodríguez, Havidàn and Russell R. Dynes

“Finding and Framing Katrina: The Social Construction of Disaster.” Presented in the Plenary Session *The Social Construction of Disaster: The Aftermath of Hurricane Katrina*, 69th Annual Meeting of the Southern Sociological Society, New Orleans, March 25, 2006.

Rodríguez, Havidàn, Joanne Nigg, Daniel Marks, and Gabriela Wasileski

“Consequence Based Predictive Models of Business Closure and Relocation.” Presented at the National Science Foundation (NSF) site visit, Mid-America Earthquake Center, University of Illinois at Urbana-Champaign, Urbana, Illinois, November 15, 2006.

Rodríguez, Havidàn and Joseph Trainor

“The Disaster Research Center.” Presented at *The Dynamics of Societal Resilience Small Group Meeting*, Australian Government, Department of Defence, Defence Science and Technology Organisation, University House, Australian National University, Canberra, Australia, May 22–23, 2006.

Santos-Hernández, Jenniffer

“Vulnerability to Natural Disasters: Understanding the Differentiated Effects of Disasters.” Presented at the DRC Summer Research Experience for Undergraduates, University of Delaware, Newark, Delaware, June 21, 2006.

Santos-Hernández, Jenniffer (continued)

“Geographic Information Systems: Applications for Emergency Management and Disaster Research.” Presented at the DRC Summer Research Experience for Undergraduates, University of Delaware, Newark, Delaware, June 8, 2006.

“Hispanics and the American Dream or the American Delusion: Intersecting Structural Properties in Hurricane Katrina.” Presented at the Panel: *The Politics of Exclusion in Latin America*, 36th Annual Conference, Association of Black Sociologists, Montreal, Quebec, Canada, August 9, 2006.

“Surviving Graduate School.” Presented at the Annual Meeting of the American Sociological Association (ASA), Montreal, Quebec, Canada, August 12, 2006.

Santos-Hernández, Jenniffer, Havidàn Rodríguez, and Walter Díaz

“Agency, Inequality and Power: Vulnerability to Disasters in the West Coast of Puerto Rico.” Presented at the National Science Foundation (NSF) site visit, Collaborative Adaptive Sensing of the Environment (CASA). University of Massachusetts-Amherst, Amherst, Massachusetts, April 24, 2006.

“Agency, Inequality and Power: Vulnerability to Disasters in Puerto Rico’s West Coast.” Presented at the 31st Annual Hazards Research and Applications Workshop, University of Colorado at Boulder, Boulder, Colorado, July 9–12, 2006.

“Development and Vulnerability to Disasters in the West Coast of Puerto Rico.” Presented at the Second Hands-On Research Retreat, Center for Collaborative Adaptive Sensing of the Atmosphere (CASA), Estes Park, Colorado, October 14, 2006.

Santos-Hernández, Jenniffer, Havidàn Rodríguez, Walter Díaz, William Donner, and Daniel Marks

“Integrating the End-User Community: Current and Ongoing Research.” Presented at the 31st Annual Hazards Research and Applications Workshop, University of Colorado at Boulder, Boulder, Colorado, July 9–12, 2006.

Torres, Manuel R.

“Risk, Terrorism and the White Male Effect: Social Demographic Impact on Risk Perception Post World Trade Center 9/11.” Presented at the Annual Meeting of the Eastern Sociological Society, Boston, Massachusetts, February 24, 2006.

Trabal, Jorge, Brian Donovan, Jackie Miller, and Jenniffer Santos-Hernández

“Puerto Rico Student Test Bed: IP3 X-ings.” Presented at the Second Hands-On Research Retreat. Center for Collaborative Adaptive Sensing of the Atmosphere (CASA), Estes Park, Colorado, October 14, 2006.

Trainor, Joseph

“Organizations in action: Understanding the Katrina Response.” Presented at the Academy of Lifelong Learning, University of Delaware Wilmington Campus, Wilmington, Delaware, April 17, 2006.

Trainor, Joseph

“Multi-Organizational Resiliency in Disasters.” Presented at the Defense Science Technology Organisation (DSTO) Meeting on the Dynamics of Societal Resilience, Canberra, Australia, May 23, 2006. (Sponsored by the Australian Department of Defense).

“An Introduction to Network Analysis.” Presented to the Department of Urban Affairs and Public Policy, University of Delaware, Newark, Delaware, June 29, 2006.

Trainor, Joseph and Benigno Aguirre

“Origins, Organizations, and Institutions: The History and State of FEMA’s Urban Search and Rescue System.” Presented at the Southern Sociological Society Annual Meeting, New Orleans, Louisiana, March 23, 2006.

Trainor, Joseph, Benigno Aguirre, and Richard Buck

“Re-evaluating ICS Criticism.” Presented at the 31st Annual Hazards Research and Applications Workshop, University of Colorado at Boulder, Boulder, Colorado, July 9-12, 2006.

Trainor, Joseph, John Barnshaw, and Benigno Aguirre

“A Critical Evaluation of the Incident Command Systems and NIMS.” Presented at the Emergency Preparedness and Prevention Pennsylvania EPA Region III Annual Conference, Valley Forge, Pennsylvania. December 5, 2006.

Wachtendorf, Tricia

“Exploring Social Vulnerability in Hurricane Katrina.” Presented as part of the *Research on Race, Ethnicity and Culture* Lecture Series, University of Delaware, Newark, Delaware, April 12, 2006.

Wachtendorf, Tricia, Bethany Brown, Jose Holguin-Veras, Satish Ukkusuri, and Noel Perez

“Communicating Convergence: Contending with Supplies Following Hurricane Katrina.” Presented at the Katrina Research Symposium: *Social Science Research of the Katrina Aftermath*, New Orleans, Louisiana, November 3, 2006.



New York, New York (Sept. 11) — Coast Guard crewmembers patrol the harbor after the collapse of the World Trade Center. Terrorist hijacked four commercial jets and then crashed them into the World Trade Center in New York, the Pentagon and the Pennsylvania countryside. USCG photo by PA3 Tom Sperduto. The U.S. Coast Guard Imagery Server is provided as a public service by the Office of Assistant Commandant for Governmental and Public Affairs.

Disaster-Related Academic & Professional Activities

Aguirre, Benigno

- * Member, Editorial Board, *Journal of Disaster Psychiatry*.
- * Organizer, Regular Session on the Sociology of Disasters, American Sociological Association Meeting, August, 2006.

Barnshaw, John

- * Member, Contingency Planning Association of the Carolinas, 2002–2006.
- * Presider, Sociology of Disaster Section, 101st Annual Meeting of American Sociological Association, Montreal, Quebec, Canada, August 13, 2006.

Letukas, Lynn

- * *Comparative Analysis of the Media Portrayal of the Indian Ocean Tsunami*, project developed at the Research Experience for Undergraduates (REU) Program, Disaster Research Center, University of Delaware, completed April, 2006.
- * Quantitative Data Analysis of Hurricane Katrina Project: Mass Fatalities Management, cooperative project with Dr. Henry Fischer, Center for Disaster Research and Education (CDRE), Millersville University, Millersville, Pennsylvania, completed May, 2006.
- * *Project to Improve Property Assessment Process Using GIS Capabilities* for the Housing Development Corporation of Lancaster County, Pennsylvania, completed 2006.

Nigg, Joanne

- * Coordinator, Emergency and Environmental Management concentration for Sociology majors, University of Delaware.
- * Member, Editorial Advisory Board, *International Journal of Risk Management*, 1997–present.
- * Invited Member, Citizen Engagement in Health Emergency Planning Working Group, University of Pittsburgh Medical School, Baltimore Campus, 2006–Present.
- * Invited Participant, NSF research agenda-setting meeting on critical infrastructural systems, December, 2006.

Quarantelli, E. L.

- * Reviewer, *Biosecurity and Bioterrorism*.
- * Reviewer, *Disasters*.
- * Review Coordinator, *Facing Hazards and Disasters: Understanding Human Dimensions*. Washington, D.C.: National Academy of Sciences, 2006.
- * Consultant for California Little Hoover Commission Review of California emergency preparedness.

Rodríguez, Havidàn

- * Co-Author, *Terrorism and the Chemical Infrastructure: Protecting People and Reducing Vulnerabilities*. Committee on Assessing Vulnerabilities Related to the Nation's Chemical Infrastructure, National Research Council, The National Academies. Washington, D.C.: The National Academy Press, 2006.
- * Reviewer, *Ecological Economics*.
- * Member, Advisory Board of the Social Science Research Council (SSRC) Task Force on Hurricane Katrina and Rebuilding the Gulf Coast.
- * Member, Committee on Assessing Vulnerabilities Related to the Nation's Chemical Infrastructure, Division on Earth and Life Studies Transportation Research Board, Board on Chemical Sciences and Technology, National Academies, 2004–2006.
- * Member, Disasters Roundtable Steering Committee, National Research Council, The National Academies, 2004–Current.
- * Member, Committee on Using Demographic Data and Tools More Effectively to Assist Populations at Risk of Facing Disasters, National Research Council, The National Academies, 2005–Current.
- * Panelist, “Quantitative Reasoning across Disciplines: It’s Not Just Math 114.” General Education Institute, University of Delaware, June 6–7, 2006.
- * Discussant, Research Committee on Disaster Session, International Sociological Association, Durban, South Africa, July 25, 2006.
- * Moderator, “When does Citizen Engagement Work Best?: Lessons Learned from Research and Experience.” Panel for the Disaster Roundtable 18: Citizen Engagement in Emergency Planning for Flu Pandemic, The National Academies, Washington, DC: October 23, 2006.

Santos-Hernández, Jenniffer

- * Webmaster, Disaster Research Center, University of Delaware.

Trainor, Joseph

- * Reviewer, *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*, Natural Hazards Center Edited Volume, 2006.
- * Reviewer, *International Journal of Mass Emergencies and Disasters*.
- * Reviewer, *Disasters*.

Wachtendorf, Tricia

- * Member, DRC Director Search Committee.
- * Member, Advisory Board: *Learning from Earthquakes*, Earthquake Engineering Research Institute.
- * Member, Student Activities Board, Earthquake Engineering Research Institute.
- * Invited participant: “*Managing Extreme Events: Transatlantic Perspectives*.” University of Pittsburgh, Pittsburgh, Pennsylvania, March 3-4, 2006.
- * Invited participant, Foundation for Educational Exchange between Canada and the United States meeting, “*Emergency Preparedness: Joint Responses to Common Threats*” Ottawa, Ontario, Canada, March 23, 2006.



Reliant Arena, Houston, Texas (September, 2005) — John Barnshaw (DRC) interviews a special needs evacuee from New Orleans.

(photo by Louise McKissik)

Other Professional Activities

Aguirre, Benigno

- * Organizer, Session on *The Meaning of Political Exile*, Association for the Study of the Cuban Economy, Miami, Florida, August 4, 2006.
- * Elected member of the Publications Committee of the Society for the Study of Social Problems (SSSP), 2006–2009.
- * Chair, Permanent Organization and Strategic Planning Committee, Society for the Study of Social Problems, 2006–2008.
- * Elected member of the Steering Committee, American Association of University Professors, University of Delaware, 2006–2008.
- * Member, Committee on Committees and Nominations (COCAN), Faculty Senate, University of Delaware, 2006–2008.
- * Member, Senior Criminology Faculty Search, Department of Sociology and Criminal Justice, University of Delaware, 2005–2006.
- * Member, Race Area Committee, Sociology and Criminal Justice Department, University of Delaware, 2005–2006.
- * Chair, Collective Behavior Area Examining Committee, Department of Sociology and Criminal Justice, University of Delaware, 2006.
- * Chaired Doctoral committee of Gabriel Santos, December, 2006 graduate.
- * Chaired Masters committee of Manuel Torres, 2006.

Barnshaw, John

- * Member, American Sociological Association, 2002–2006.
- * Member, Alpha Kappa Delta (International Sociology Honor Society), 2002–2006.
- * Member, Gerontological Society of America, 2003–2006.
- * Member, Metrolina AIDS Project, 2004–2006.
- * Member, Sociologos Sin Fronteras (Sociologists Without Borders), 2005–2006.
- * Member, Eastern Sociological Society, 2006.
- * “Intervention Strategies for Men on the Down Low.” Presented at the 76th Annual Meeting of Eastern Sociological Association, Boston, Massachusetts, February 26, 2006.
- * “The Interface between Sociology and Medical Epidemiology.” Presented at the Medical Epidemiology and Biostatistics Department, Karolinska Institutet, Stockholm, Sweden, June 16, 2006.
- * “Intervention Strategies for Men on the Down Low.” Presented at the 16th Meeting of the International AIDS Conference, Toronto, Ontario, Canada, August 15, 2006.
- * Co-Chair, Emerging Scholar and Professional Organization, Gerontological Society of America.

Barnshaw, John and Stephanie Southworth

- * “Keeping Up or Falling Behind? Segregation Effects among Race-Gender Cohorts.” Presented at the 69th Annual Meeting of Southern Sociological Society, New Orleans, Louisiana, March 25, 2006.
- * “No Child Left Behind, School Choice, and the Charlotte-Mecklenburg School District: A Case Study.” Presented at the 101st Annual Meeting of the American Sociological Association, Montreal, Quebec, Canada, August 13, 2006.

Barnshaw, John and Diane Zablotzky

- * “Differences in Sexual Risk Taking Behavior across the Life Course among Men who have Sex with Men.” Presented at the 59th Annual Meeting of the Gerontological Society of America, Dallas, Texas, November 17, 2006.

Barsky, Lauren

- * Member, American Sociological Association.
- * Member, Alpha Kappa Delta (Sociology Honor Society).
- * Member, Society for the Study of Social Problems.
- * Graduate Student Representative, Faculty Meeting Committee, Department of Sociology and Criminal Justice, University of Delaware.

Howery, Carla B. and Havidàn Rodriguez

- * “Integrating Data Analysis (IDA): Working with Sociology Departments to Address the Quantitative Literacy Gap.” Co-authored article, pp. 23–38 in *Teaching Sociology*. Special issue on *Cultivating Quantitative Literacy*, Vol. 34, No. 1, 2006.

Letukas, Lynn

- * Member, Association of American Geographers.
- * Member, Southern Sociological Association.
- * Member, Eastern Sociological Association.
- * Member, American Sociological Association.

Poteyeva, Rita

- * Graduate Student Representative, Graduate Policy Committee, Department of Sociology and Criminal Justice, University of Delaware.
- * Member, American Society of Criminology.
- * Member, Law and Society Association.
- * Member, Academy of Criminal Justice Sciences.
- * "Sentencing Differentials for Killing Kids: The Interaction Effects of Gender and the Victim/Offender Relationship." Presented at the Annual Meeting of the American Society of Criminology, Los Angeles, California, November 1-4, 2006.

Rodríguez, Havidàn

- * Member, President's Commission to Promote Racial and Cultural Diversity, University of Delaware, 2006-Current.

Santos-Hernández, Jenniffer

- * Graduate Student Representative, University of Delaware, Faculty Meeting Committee, Department of Sociology and Criminal Justice, University of Delaware.
- * Student Representative, Student Leadership Council, Center for Collaborative and Adaptive Sensing of the Atmosphere (CASA), National Science Foundation.
- * Attended the National Science Foundation Engineering Research Centers Annual Meeting, Hyatt Regency Bethesda, Bethesda, Maryland, November 29 - December 1, 2006.
- * Attended Student Leadership Council Annual Retreat, National Science Foundation Engineering Research Centers, Hyatt Regency Bethesda, Bethesda, Maryland, November 29, 2006.

Torres, Manuel

- * Graduate Student Representative, Faculty Meeting Committee, Department of Sociology and Criminal Justice, University of Delaware.
- * Member, American Sociological Association.

Wachtendorf, Tricia

- * Member, Undergraduate Policy Committee, Department of Sociology & Criminal Justice, University of Delaware.
- * Member, Disasters and Collective Behavior/Social Movements Committee, Department of Sociology & Criminal Justice, University of Delaware.
- * Member, Department Chair Search Committee, University of Delaware.
- * Reviewer, Thomson Nelson Press.
- * Reviewer, National Science Foundation.

Wasileski, Gabriela

- * Member, Eastern Sociological Society.



Gulfport, Mississippi (September, 2005) — A Baptist Church in Gulf Port, Mississippi had become a local distribution center for clothing and food.

(photo by DRC staff)

Undergraduate Students' Achievements

Bayles, Jennifer

- * Participant, Study Abroad Program to Buenos Aires, Argentina.
- * Member, Alpha Kappa Delta (Sociology Honor Society).
- * Member, National Society of Collegiate Scholars.
- * University of Delaware Dean's List.

Bomfim, Caroline

- * Attendee, 11th International Youth Leadership Conference, Prague, Czech Republic, 2006.
- * Awarded "Best Delegate" status by the Organizers at the International Youth Leadership Conference.
- * Recipient, CFIS General Scholarship to travel to Granada, Spain in 2007.
- * Recipient, FLLT Study Abroad Scholarship to travel to Granada, Spain, 2007.
- * Recipient, Merit Scholarship to attend the International Youth Leadership Conference.

Clark, Mike

- * University of Delaware Dean's List.

Denver, Megan

- * Participant, Study Abroad Program to Athens, Greece.
- * Participant, Study Abroad Program to Madrid, Spain.
- * Member, Alpha Kappa Delta (Sociology Honor Society).
- * University of Delaware Dean's List.

Engle, Jeffrey

- * University of Delaware Honors Program.
- * Participant, Chorale, University of Delaware.
- * Participant, Theater, University of Delaware.

Flores, Claudia

- * Recipient, Latino/Latina Students of Distinction Award.
- * Participant, *Odyssea Language Program*, Montpellier, France, June 4 - July 5, 2006.
- * Recipient, *Excel* Scholarship.
- * Member, University of Delaware Honors Program.
- * University of Delaware Dean's List.

Moses, Michelle

- * Recipient, MBNA Scholarship.
- * University of Delaware Dean's List.

Ross, Lauren

- * Completed Senior Thesis Program, Degree with Distinction.
- * Participant, Summer Research Experience for Undergraduates (REU) Program, Disaster Research Center, University of Delaware.
- * Recipient, Winter Session Scholar Award.
- * Member, National Political Science Honor Society.
- * Guest Lecturer, "Disasters and Society" undergraduate class, University of Delaware.
- * Participant, University of Delaware Honors Program.

Westfall, Jennifer

- * University of Delaware Dean's List.

Williams, Caroline

- * Recipient, FEMA Certification in Animals and Disasters.
- * Recipient, FEMA Certification in The Incident Command System.
- * Recipient, FEMA Certification in The Role of Emergency Operations Centers.
- * Recipient, FEMA Certification in Radiological Emergency Management.
- * Recipient, Red Cross Certification in Introduction to Disaster Services.
- * University of Delaware Dean's List.

Wurcel, Julie

- * Member, Phi Sigma Delta (Spanish National Honor Society).
- * Member, Political Science National Honor Society.
- * Summer Internship with New Haven Legal Assistance Association.
- * University of Delaware Dean's List.



Astrodome, Houston, Texas (September, 2005) — Evacuees look at pictures of missing Individuals.

(photo by Louise McKissik)



Slidell, Louisiana (September 2005) — Construction Crews begin removing debris from the devastated area.

(photo by DRC staff)

Project Descriptions

Behavioral Model of Pedestrian Dynamics.

DRC Principal Investigator: Benigno E. Aguirre (with Natacha E. Thomas, University of Rhode Island)

Project Leaders: Gabriel Santos, Lauren Barsky

Funding Agency: National Science Foundation

The project develops a Cellular Automata (CA) model and associated prototype software for the simulation of environmentally-constrained and managed pedestrian motion during normal times and during emergency situations that result in evacuations. The model captures naturally occurring interactions involving the environment, the pedestrians, physical constraints, emergency constraints, and the evacuation policies and controls that a management authority would attempt to implement. From a social science perspective it is useful to think of evacuation behavior during emergencies as having three distinct analytical dimensions: the physical environment being evacuated, the managerial policies and controls deployed at evacuation, and the psychological and social organizational factors impacting the people present during the emergency. It is much more common in the physics and engineering literature to find consideration of the first two dimensions than of the third. The proposed study addresses the essence, and the interactions, of all three dimensions of the pedestrian evacuation problem to predict the course of events following the enactment

of specified evacuation policies and controls. The project results will be interpreted in light of accumulated knowledge on the sociology of disasters, allowing for the provision, to local and federal government agencies as well as private organizations, of a useful blueprint to follow during crisis evacuations. This provision of guidance is an important benefit to society, as it improves disaster response programs at the local, state and federal levels. The need for a social science study of crisis evacuation is particularly keen nowadays as terrorist threats have increased. Project conduct entails the training of graduate and undergraduate students in the mastery of analysis approaches and the participation of female and minority faculty in science. Project results further facilitate consideration of evacuation in the design phase of architectural, engineering, and urban design studies. (T. E. Greene Airport in Providence, Rhode Island, is the proposed simulation test-bed. The Rhode Island Airport Corporation vouches for its strong support of the proposed effort and anticipates using the derived simulation software.)

Characterization of the Supply Chains in the Aftermath of an Extreme Event: The Gulf Coast Experience.

DRC Co-Principal Investigator: Tricia Wachtendorf (with Jose Holguin-Veras and Satish Ukkusuri, Rensselaer Polytechnic Institute)

Project Leader: Bethany Brown

Undergraduate Research Assistants: Chris Colindres, Jeffrey Engle, Lauren Ross, Caroline Williams

Funding Agency: National Science Foundation

This project is concerned with gathering perishable information and data about the basic features of the formal and the informal logistic systems supporting the recovery and the flows of critical and non-critical supplies to areas impacted by Hurricane Katrina. Prior research points to the challenges associated with setting up supply chains to an impacted site that fully account for immediate resource requirements, the range of supply sources and source mechanisms, as well as the management and prioritization of critical versus non-essential donations. This Small Grant for Exploratory Research project will (1) identify the basic features of the supply chains delivering resources to the Gulf Coast;

(2) Gather data about the actual flows of critical and non-critical supplies; and (3) Document lessons learned, both positive and negative. This research will provide future researchers with a clear picture of the supply chains in place at the site of an extreme event, which will enable the development of much needed decision support systems. The proposed research involves multi-university collaborations between Rensselaer Polytechnic Institute and the University of Delaware. It makes use of quick response data collected by the University of Delaware's Disaster Center in the weeks following the hurricane and leverages resources of Rensselaer's Center for Intermodal Freight Mobility and Security.

Collaborative Research Proposal on Improvisation and Sensemaking in Sudden Crisis.

DRC Principal Investigator: Tricia Wachtendorf (with James M. Kendra, University of North Texas and Jasmin Ruback, Ruback & Associates)

Project Leaders: John Barnshaw, Lynn Letukas

Undergraduate Research Assistants: Chris Colindres, Jeffrey Engle, Scott Golden, Lauren Ross, Caroline Williams

Funding Agency: National Science Foundation, University of Delaware Research Foundation

This project examines organizational improvisation and sensemaking under conditions of rapid change and urgent needs for decision and action. The project studies the unplanned waterborne evacuation of hundreds of thousands of commuters from Lower Manhattan after the September 11, 2001 attack on the World Trade Center, and the subsequent improvised boat-lift of supplies and equipment into the city. Focus is on sensemaking and improvisation across multiple organizations that are geographically dispersed yet nevertheless

able to "make sense" with each other regarding swiftly-developing emergency needs and to coordinate their actions responsively and productively. Analytical methods include an inductive qualitative approach to interview and documentary data as well as a social network analysis of pre- and post-attack relationships among participants and geographically referenced to points in the New York-New Jersey-Staten Island area. This collaborative project is with James Kendra (PI) at the University of North Texas.

DRU: Contending with Materiel Convergence: Optimal Control, Coordination, and Delivery of Critical Supplies to the Site of Extreme Events.

DRC Co-Principal Investigator: Tricia Wachtendorf (with Jose Holguin-Veras, Rensselaer Polytechnic Institute, and multiple Co-PIs from the University of Delaware, Rensselaer Polytechnic Institute, and University of Puerto Rico at Mayaguez)

Project Leader: Bethany Brown

Undergraduate Research Assistants: Jeffrey Engle, Caroline Williams

Funding Agency: National Science Foundation

The overall goal is to develop methodologies and tools to foster an accelerated convergence between the dynamic needs and supplies of critical resources (e.g., blood, water) to the site of an extreme event. These methodologies will be based on state of the art concepts from the social sciences, control theory, and robust stochastic optimization of dynamic supply chains with the aim of reducing adverse impacts of convergent low priority goods, while expediting the flow of high priority supplies to various response related sites. This topic was identified as a critical research issue by Mr. Joe Picciano, Acting Director of FEMA Region II at

the time of the 9/11 attacks, who highlighted that such techniques are of critical importance to "...improve the distribution of critical assets and goods in a catastrophic event..." This was again emphasized by many of those handling supplies in the aftermath of Hurricane Katrina when interviewed by team members. These methodologies could help: (a) ensure that emergency workers and support staff have the critical resources they need for an efficient rescue operation; (b) prioritize the incoming flows of donations; and (c) distribute the critical supplies efficiently to impacted areas.

Disaster Realities in the Aftermath of Hurricane Katrina: Revisiting the Looting Myth.

DRC Principal Investigator: Lauren Barsky

Funding Agency: Natural Hazards Center at the University of Colorado at Boulder

In the aftermath of Hurricane Katrina, a number of media stories that made extensive references to reports of looting emerged from New Orleans and the surrounding areas heavily impacted by Hurricane Katrina. Given the discrepancy between long-standing assertions in sociological literature on disasters portraying widespread looting as a myth and the conflicting reports coming out of these heavily impacted disaster areas, semi-structured interviews with individuals and organizational actors were conducted in order to examine the extent to which looting actually occurred in the aftermath of Hurricane Katrina. In instances where

looting was reported, information was obtained in order to differentiate between individuals taking non-essential items and those engaging in appropriating behavior (i.e., taking items necessary for survival). Also, for cases in which looting actually did occur, questions were asked regarding motivations for this behavior. This research is useful in understanding the activities labeled as looting in this disaster, the extent to which media accounts accurately portrayed the behavior, the context surrounding the behavior, and its implications for understanding behavior and reporting in other high consequence events in the United States.

FEMA's USAR Taskforce Deployments: Implications for the Management of Emergency Response.

DRC Principal Investigator: Benigno E. Aguirre
Project Leader: Joseph Trainor
Research Assistants: Lauren Barsky, Rita Poteyeva, Manuel Torres
Undergraduate Research Assistants: Megan Denver, Jen Westfall
Funding Agency: National Science Foundation

The Urban Search and Rescue taskforces (USAR) sponsored by the National Science Foundation, a key component of the federal emergency response system, are examined to determine: 1) the extent to which these taskforces are impacted by known problems at search and rescue (SAR) operations, as well as the solutions they have developed to these problems; and 2) their interaction with other agencies, EMS personnel, volunteers, and law enforcement organizations, in what has become a critical factor in the conduct of present day SAR operations. Information comes from documents, focus groups with ten USAR taskforces, and in-depth interviews with 117 key informants representing other agencies and groups that participated in nine major USAR deployment sites. To check on the validity of the findings, results of the content analysis of textual material

are compared to the findings from statistical analyses of this same information. The research addresses the diversity goals of the NSF. It supports the training of two minority doctoral students and two minority undergraduate students. Results will be made part of graduate and undergraduate courses in risk analysis and emergency planning, and of programs and training at FEMA. The primary outcome of the study will be a useful blueprint for local, state, and federal agencies and private organizations to follow during participation in SAR operations that will help improve the effectiveness of disaster responses and USAR activities. It also contributes to the social science understanding of the emergent multiorganizational SAR system as a form of organized, adaptive crisis response social organization.

Organizational and Community Resilience in the World Trade Center Disaster.

DRC Principal Investigators: Kathleen Tierney and Benigno E. Aguirre
Other Lead Personnel: Tricia Wachtendorf
Project Lead: Joseph Trainor
Funding Agencies: Public Risk Entity Institute (PERI); National Science Foundation through the Multidisciplinary Center for Earthquake Engineering Research (MCEER).

This project focuses on the manner in which emergency management and crisis-relevant organizations in the City of New York coordinated with other responding organizations and jurisdictions to develop multi-organizational strategies for managing the World Trade Center Disaster. The project uses the World Trade Center attack and its aftermath as a case study to address longstanding issues in the disaster research literature, such as the

relationship between planning, emergence, and improvisation in disaster response activities; how multi-organizational response networks develop and function; and how resilience is achieved in complex response networks. Research activities for this study consist of field work and direct observation in settings in which response and recovery activities are coordinated; interviewing; and document collection and analysis.

Population Composition, Geographic Distribution, and Natural Hazards: Vulnerability in the Coastal Regions of Puerto Rico.

DRC Principal Investigator: Havidán Rodríguez (with Walter Díaz and Aurelio Mercado, University of Puerto Rico-Mayagüez – UPRM)

Project Leader: Jenniffer Santos-Hernández

Undergraduate Research Assistants: Caroline Bomfim, Chris Colindres, Claudia Flores, Jen Westfall

Funding Agency: University of Puerto Rico Sea Grant College Program

Given its geographic location and climatological characteristics, Puerto Rico is highly susceptible to natural hazards (e.g., hurricanes, floods, tsunamis, and earthquakes). Coastal or riverine flood areas and steep mountains characterize much of Puerto Rico. Hurricanes San Ciriaco (1899), San Felipe (1928), San Ciprián (1932), Santa Clara (1956), Hugo (1989), and Georges (1998) have had a significant social and economic impact on the Island's population and economy. As a result of changing social and demographic patterns in Puerto Rico, there has been a significant increase in population density, in the proportion of the elderly and physically disabled population, and an increasing concentration of residents in flood and/or landslide prone areas and especially along the coastline. According to the Insurance Commissioner's Office, as of June, 2003, 160,000 families were living in flood prone areas in Puerto Rico, of which 43,568 (27.2%) did not have flood insurance. These factors have contributed to the increasing vulnerability to natural hazards on the Island. The primary goal of this project is to understand how these and other factors contribute to the vulnerability of the Puerto Rican population living in coastal regions, how they have changed from 1990 to 2000, and how risk and vulnerability vary according to different social, economic, and demographic

variables. To accomplish the aforementioned goal, we developed geographical maps, in both paper and GIS format, of the coastal areas of Puerto Rico that include detailed demographic and socioeconomic data of the resident population. Using 1990 and 2000 Census data, Project Leader Santos-Hernández completed the estimation of the first version of the vulnerability to storm surge flooding index for Puerto Rico. This research project allowed us to develop a better understanding regarding the demographic and socio-economic factors that contribute to the vulnerability, perception of risk, disaster mitigation, and preparedness among communities on the Island's coastal regions. Further, it will also provide government agencies and emergency management organizations with detailed information that will allow them to play a critical role in mitigating the effects of natural hazards in Puerto Rico. The Disaster Research Center (DRC) has purchased the software necessary to publish on the Internet, in an interactive format, the vulnerability maps that we have developed. This research project was a collaborative and interdisciplinary effort between the Disaster Research Center at the University of Delaware, the Center for Applied Social Research (CISA) and the Physical Oceanography Laboratory in the Department of Marine Sciences, both at the University of Puerto Rico-Mayagüez.

Quantitative Models of Social and Economic Consequences

DRC Principal Investigator: Havidán Rodríguez (Project Principal Investigator: Steve French, with Walter Peacock (TAMU), Ed Feser (UIUC), and Ricardo López (UPRM))

Project Leader: Daniel Marks

Graduate Research Assistant: Gabriela Wasileski

Undergraduate Research Assistant: Julie Wurcel

Funding Agencies: National Science Foundation through the Mid-America Earthquake Center (MAE); University of Delaware Research Foundation

“While a significant literature exists on the social and economic impacts of natural disasters, this knowledge has not been translated into quantitative models that can be used to predict the level of consequences that are likely to result from events of different magnitudes. To model the social and economic consequences of earthquakes will require the development of models that are driven by the physical damage estimates produced by engineering models. MAE Center research has produced robust models to predict physical damage to buildings, transportation networks and infrastructure systems. This project will extend those models to predict the social and economic consequences that are often the most salient concerns of decision makers. Major social impacts that have been identified include short and long-term shelter needs, short and long term job loss, business failures, number of casualties, direct dollar losses and business

interruption losses. The project team will compile an exhaustive list and identify those that can be effectively modeled. The project goals and objectives include: 1) to advance the state-of-the-art of social science research on earthquake hazards to be better aligned and integrated with the quantitative modeling approach that characterizes current research in the geophysical and engineering areas; 2) the development of a set of quantitative models to estimate the social and economic consequences that result from the physical damage produced by earthquake of various sizes; and 3) the development of a cross-hazard metric to characterize the damage states produced by a hazard event (earthquake, flood or hurricane). This metric will be the exogenous variable that drives the social and economic models.” (Quoted from the MAE Social Science Quad-Chart, Project Number: DS-7b).

Research Experience for Undergraduates (REU) Program: Training the New Generation of Disaster Researchers.

DRC Principal Investigators: Havidàn Rodriguez and Joanne Nigg

Project Leader: Lauren Barsky

Undergraduate Research Assistant: Michelle Moses

Funding Agency: National Science Foundation

The National Science Foundation funded (2005–2007) the University of Delaware’s Disaster Research Center (DRC) to establish a Research Experience for Undergraduates (REU) site to engage ten (10) undergraduate students in hands-on research training to enhance their understanding of the social science aspects of disasters. Each summer, a nine (9) week research training institute will be held at DRC to provide students with the necessary academic background, training, and relevant research experiences to prepare them to function as relatively independent research scholars. Course models will focus on research methodology, social science approaches to understanding

the causes and consequences of disasters, and ethical implications of the research process. Students will work with leading scholars and researchers on state-of-the-art research projects that focus on issues such as disaster mitigation, preparedness, response, recovery, vulnerability, and resilience. A multi-disciplinary group of leading disaster researchers and practitioners will participate in the *Invited Speaker Series* in order to emphasize the contributions that other disciplines bring to this field. A series of professional development and social-cultural activities will complement the trainees’ overall education and training.

Research Experience for Undergraduates Supplement Improvisation and Sensemaking in Sudden Crisis.

DRC Principal Investigator: Tricia Wachtendorf

Project Leader: John Barnshaw

Undergraduate Research Assistant: Scott Golden

Funding Agency: Funded by the University of Delaware Research Foundation

This supplement to the REU Program described above provides funds for one undergraduate student to conduct summer research on an existing grant. The existing grant focuses on improvisation and sensemaking during the unplanned waterborne evacuation of

commuters from Lower Manhattan by an ad hoc flotilla of ferries, tugs, workboats, dinner cruise boats and other assorted harbor craft after the 9/11 attacks on the World Trade Center, and the subsequent improvised boat-lift of supplies and equipment into the city.

Technology, Weather Forecasts, and Warnings: Integrating the End-User Community.

DRC Principal Investigator: Havidán Rodríguez (with Walter Díaz, University of Puerto Rico-Mayagüez – UPRM)

Project Leader: William Donner

Graduate Research Assistants: Daniel Marks, Jenniffer Santos

Undergraduate Research Assistants: Caroline Bomfim, Michael Clark, Claudia Flores, Michelle Moses

Funding Agencies: National Science Foundation (NSF); Engineering Research Center for the Collaborative Adaptive Sensing of the Atmosphere (ERC-CASA)

Scientists at DRC and the Center for Applied Social Research at the UPRM (CISA) are contributing to the research efforts of Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) by exploring the social and human dimensions of severe weather forecasts and warnings. CASA is a recently established Engineering Research Center (ERC) within NSF's Directorate for Engineering that focuses on the development of revolutionary sensing technology that will enable earlier and more accurate forecasts of severe weather events. CASA's technology is expected to increase the warning time for tornadoes, flash floods, and other severe weather events with greater accuracy than existing systems. The aim of the recently funded ERC is to establish the necessary infrastructure to sense, analyze, and predict lower atmospheric events and to respond to potentially hazardous phenomena in order to significantly reduce their impact on society. More accurate and reliable weather forecasts and warning systems (based on the technology proposed by CASA researchers) may lead to improved disaster mitigation, preparedness, and response initiatives. However, improving weather forecasts and increasing lead times is only part of the equation in determining the ultimate effectiveness of organizational and individual preparedness and response to natural hazards. Social Scientists in the CASA project are focusing their research efforts on examining

how improved forecasting can reduce the exposure and vulnerability of individuals and property to everyday and extreme weather events. Specifically, through the use of survey methodology, focus groups, and in-depth interviews, we are examining how the end-user community—particularly emergency managers and members of the general public—access, utilize, and respond to weather forecasts. We also seek to explore their knowledge and interests concerning weather forecasting issues, attitudes towards climatological information, and their needs and interests in relation to the use of meteorological information. We aim to answer a variety of questions, including: Who has access to climatological information and weather forecasts?; What are the primary sources of weather information used by emergency management agencies?; How much confidence do these end-users have in this type of information?; According to the end-users, how reliable are weather forecasts and warnings?; How does climatological information affect the decision-making processes of this community of end-users?; and finally, How does the public respond to and interpret warnings issued by the National Weather Service (NWS), emergency managers, and the media? We have already initiated the data collection process in Oklahoma, Louisiana, Missouri, and Tennessee; in the future, we will collect similar types of data in Texas and Puerto Rico.

To Rebuild or to Relocate? An Investigation of Post-Catastrophe Housing Decisions among Hurricane Katrina Survivors.

DRC Principal Investigator: John Barnshaw

Undergraduate Research Assistant: Lauren Ross

Funding Agency: Natural Hazards Center at the University of Colorado at Boulder

This research sought to investigate experiences in evacuation, sheltering and intentions to return to an impacted area or relocate elsewhere in the aftermath of Hurricane Katrina. This project collected perishable data in the form of documents and 49 interviews among evacuees and key decision makers in Houston,

Texas following the mandatory evacuation of New Orleans. This existing grant provided supplementary funds for one undergraduate student to conduct research on political attitudes, evacuation, sheltering and housing intentions of survivors in the weeks following Hurricane Katrina.



Slidell, Louisiana (September, 2005) — This sign is indicative of the preexisting cultural sentiments and the role they played in interpreting the events.

(photo by DRC staff)

Disaster Research Center Field Studies

**January, March,
August, October,
November, December**

John Barnshaw

**New York, New York; Staten Island, New York;
Perth Amboy, New Jersey; Hoboken, New Jersey;
Jersey City, New Jersey**

Interviewed participants involved in the waterborne evacuation of lower Manhattan on September 11, 2001.

**January, March,
November**

Bethany Brown

New Orleans, Louisiana and Biloxi, Mississippi

Interview individuals and organizations involved in managing the supply chain following the impact of Hurricane Katrina.

January, April

Jennifer Santos

**Aguadilla, Aguada, Añasco, Mayagüez, and Cabo Rojo,
Puerto Rico**

Coastal areas visited to identify and survey critical infrastructure in areas exposed to tsunami and storm surge. In addition reports on damages as a result of Hurricane Georges were obtained from several emergency managers in the region.

February, April, June

William Donner

**New Orleans, Louisiana; Springfield, Mississippi;
Dyersburg, Tennessee**

Conducted quick-response interviews in each area following tornado outbreaks.

May

Lynn Letukas

New Orleans, Louisiana

Interviewed emergency management officials regarding mass body disposal as part of Hurricane Katrina Mass Victim Identification project.

June

Jennifer Santos

Dyersburg, Tennessee

Conducted quick-response interviews in the area following tornado outbreaks.

August

Bethany Brown

New York, New York and Hoboken, New Jersey

Interviewed participants involved in the waterborne evacuation of lower Manhattan on September 11, 2001.

**October, November,
December**

Lynn Letukas

New York, New York; Staten Island, New York; Perth Amboy, New Jersey; Jersey City, New Jersey

Interviewed participants involved in the waterborne evacuation of lower Manhattan on September 11, 2001.



Astrodome, Houston, Texas
(September, 2005) — A young girl
shows us her picture of the shelter.
(photo by Louise McKissik)



Slidell, Louisiana (September, 2005)
— Manuel Torres (DRC) interviews
a resident as she waits for FEMA
adjusters to appraise the damage
from Hurricane Katrina to her
home.

(photo by DRC staff)

Visitors to DRC

January

James Kendra, University of North Texas, Denton, Texas, USA (also visited in June)
Brandi Lea, University of North Texas, Denton, Texas, USA (also visited in June)

March

Karin Steinberger, Suddeutsche Zeitung, Munich, Bayern Germany

April

Lindy Newlove, Crisis Management Research and Training (CRiSMART), Stockholm, Sweden

May

Camille Ainsworth, University of Edinburgh, Edinburgh, Scotland

June

Gabriela Vera Cortes, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Colonia Tlalpan, Mexico
Asención Avendano Garcia, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Colonia Tlalpan, Mexico
Liliana Lopez Levi, Universidad Autonoma Metropolitana (UAM-X), Mexico
Jesùs Manuel Macias, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Colonia Tlalpan, Mexico
Giovanni Vidal Ortega, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Colonia Tlalpan, Mexico
Anthony Oliver-Smith, University of Florida, Gainesville, Florida, USA
Jimena Cuevas Portilla, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Colonia Tlalpan, Mexico
Jasmin Ruback, Ruback Associates, College Park, Georgia, USA
Moises Salinas, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Colonia Tlalpan, Mexico
Chris Webb, Auckland University of Technology, Auckland, New Zealand

August

Frank George, Maryland State Funeral Directors Association, Glen Burnie, Maryland, USA
Yao Hu, New Jersey Institute of Technology, Newark, New Jersey, USA (also visited in November)
Terrie Modesto, Thanatological Education and Resource (TEAR) Center, Millington, Maryland, USA (also visited in October and December)

September

Hank Fischer, Center for Disaster Research and Education (CDRE), Millersville University, Millersville, Pennsylvania, USA
Joseph Scanlon Emergency Communications Research Unit, Carleton University, Ottawa, Ontario, Canada

October

Christer Brown, Swedish National Defence College / Crisis Management Research and Training (CRiSMART), Stockholm, Sweden

December

Janki Andharia, Jamsetji Tata Center for Disaster Management, Tata Institute of Social Sciences, Mumbai, India



In addition to our other visitors and guests for the 2007 calendar year, we were pleased to host a visiting researcher, Dr. Masaki Urano, Director of the Waseda Institute for Sustainable Community and Risk Management, Waseda University, Tokyo, Japan. Dr. Urano spent the 2005–2006 academic year researching the impact of Hurricane Katrina on the urban areas of Louisiana and particularly on New Orleans. The result of his research was an annotated bibliography of the more than 1,500 Katrina-related items added to the E. L. Quarantelli Resource Collection during his stay. Dr. Urano is pictured above (left) with then-DRC Director Dr. Havidan Rodríguez.

Research Experience for Undergraduates (REU) Year Two Activities

The Disaster Research Center's REU program included the following guest speakers:

June

- William Anderson, *National Science Foundation, Washington DC*
- Anne Bowler, *Graduate Program Director, Department of Sociology and Criminal Justice, University of Delaware, Newark, Delaware*
- Richard Buck, *Department of Sociology and Criminal Justice, University of Delaware, Newark, Delaware*
- Mary Martin, *Director Graduate Studies, University of Delaware, Newark, Delaware*
- Dave McLaughlin, *University of Massachusetts - Amherst, Amherst, Massachusetts*
- Marcia C. Nickle, *New Castle County Office of Emergency Preparedness, New Castle, Delaware*
- Jasmin Ruback, *Ruback Associates, State College, Pennsylvania*
- Mary Jane Wilkins, *Human Subjects Review Board, University of Delaware Newark, Delaware*

July

- Margi Prueitt, *American Red Cross of the Delmarva Peninsula, Wilmington, Delaware*
- Jasmin Ruback, *Ruback Associates, State College, Pennsylvania*
- Rick Sylves, *Political Sciences & International Relations, University of Delaware, Newark, Delaware*
- Mark Tinsman, *American Red Cross of the Delmarva Peninsula, Wilmington, Delaware*
- Daniel Valle, *American Red Cross of the Delmarva Peninsula, Wilmington, Delaware*

REU Participants Travel to Natural Hazards Conference



Boulder, Colorado—REU participants attended the 31st Annual Natural Hazards Research and Applications Workshop, hosted by the Natural Hazards Center, University of Colorado at Boulder. They are pictured here along with former Natural Hazards Center director Gilbert E. White (seated, front), DRC faculty member Dr. Joanne Nigg (to right of Dr. White), and DRC staff member Lauren Barsky (first row, right).

(photo by DRCstaff)

The following is a list of the 2006 REU participants, their institutional affiliations, and their research topics:

Natalie Bruce, Biola University, La Miranda, California, USA.

“Quantitative Analysis of Civilian Behavior and Injuries in 2003 Building Fires.”

Nnena Campbell, University of Central Florida, Orlando, Florida, USA.

“Material Convergence: An Exploration of the Supply Chain Following Hurricane Katrina.”

Jonathan Connors, Ithaca College, Ithaca, New York, USA.

“Organizational Goals and FEMA’s Urban Search and Rescue System.”

Casey Farmer, University of San Francisco, San Francisco, California, USA.

“Claims Making of the Environmental Health Effects of September 11th As Constructed by Media, Science, Government, and Activists.”

Kathryn Fox, Dickinson College, Carlisle, Pennsylvania, USA.

“Helper Convergence Following Hurricane Katrina: The Intersection of Inside and Outside Helper Convergence.”

Rebekah Kaplan, University of Delaware, Newark, Delaware, USA.

“The Impact of Community Attachment on Protective Action Taken during the March 12, 2006 Tornado and Hurricane Katrina.”

Jessica Long, California University of Pennsylvania, California, Pennsylvania, USA.

“An Analysis of Incoming Information Sources Utilized By Oklahoma Emergency Managers as a First Step Toward More Effective Risk Communication.”

Eugene O’Neal, St. Johns University, Jamaica, New York, USA.

“Inter-Organizational Communication in Search and Rescue: How Informal Communication Helps Organizations Co-Exist in a Search and Rescue Mission.”

Paula Perry, North Carolina A&T State University, Greensboro, North Carolina, USA.

“Are Individuals Ever Willing to Pay for Earthquake Mitigation?”

Lauren Ross, University of Delaware, Newark, Delaware, USA.

“Split Opinions of Federal Government Response Efforts Post Katrina: Socioeconomic Factors that Shape Perceptions.”

Caitlin Shenk, Lehigh University, Bethlehem, Pennsylvania, USA.

“Hurricane Katrina: A Content Analysis of Media Framing.”

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