

DISASTER RESEARCH CENTER

DEPARTMENT OF SOCIOLOGY & CRIMINAL JUSTICE

UNIVERSITY OF DELAWARE

2003 Annual Report

*87 East Main Street
Newark, DE 19716-2581
Phone: 302-831-6618
Fax: 302-831-2091
<http://www.udel.edu/DRC>*

From the Director

Since its inception, over 40 years ago, the Disaster Research Center (DRC) has played an instrumental role in the growth and development of the field of disasters, from a Social Science perspective. The contributions of DRC to the sociology of disasters have been recognized at the national and international level. Significant changes, research projects, and other important initiatives continue to emerge at DRC.

We would like to congratulate Kathleen Tierney (former Director of DRC) who is now the Director of the Natural Hazards Center at the University of Colorado. It is an honor for me to have been appointed to serve as the new Director of DRC in the Department of Sociology and Criminal Justice at the University of Delaware. It is noteworthy that we (DRC) recently moved and now have the additional space and facilities that will allow us to continue to grow and expand our research efforts. As of September 1, 2004, Tricia Wachtendorf (who has been an instrumental researcher and leader at DRC) will join the University of Delaware, the department, and DRC as an Assistant Professor.

On April 30-May 1, 2004, DRC will host a conference titled “Disaster Research and the Social Sciences: Lessons Learned and Future Trajectories.” Leading researchers in the field of disasters, practitioners, and students will join us in this conference to focus on the growth and development of the field of disasters, from the perspective of the Social Sciences; the theoretical, methodological, and public policy contributions in the field at the national and international level; lessons learned and best practices that have emerged from this field of research; and future trajectories and opportunities for Social Science disaster research. Panel discussions will highlight the development of interdisciplinary and international collaborations in the disaster field.

We are extremely pleased to present the Disaster Research Center’s (DRC) 2003 Annual Report. This report provides detailed information on DRC personnel, ongoing research projects, publications, and many other important initiatives and activities. We hope that this is a valuable resource and that it will be very useful to scholars, researchers, practitioners, students, and the general community.

Best regards,

Havidán Rodríguez, Ph.D.
Director

TABLE OF CONTENTS

	<i>Page</i>
<i>From the Director.....</i>	<i>1</i>
<i>Table of Contents.....</i>	<i>2</i>
<i>Disaster Research Center.....</i>	<i>3</i>
<i>DRC Personnel.....</i>	<i>5</i>
<i>2003 Publications.....</i>	<i>7</i>
<i>New Preliminary Papers</i>	<i>9</i>
<i>M.A. Theses</i>	<i>10</i>
<i>Presentations in Professional/Scientific Conferences.....</i>	<i>11</i>
<i>Disaster-Related Academic & Professional Activities.....</i>	<i>13</i>
<i>Other Professional Activities.....</i>	<i>15</i>
<i>2003 Research Projects.....</i>	<i>17</i>
<i>DRC Field Studies.....</i>	<i>19</i>
<i>Visitors to DRC.....</i>	<i>20</i>

Disaster Research Center (DRC) **Department of Sociology and Criminal Justice** **University of Delaware**

This year marks the 40th anniversary of the Disaster Research Center (DRC), the first social science research center in the world devoted to the study of disasters. Established at the Ohio State University in 1963 by Professors E.L. Quarantelli, Russell Dynes, and Eugene Haas, DRC moved to its current location, the University of Delaware, in 1985. Recently, the DRC welcomed Professor Havidán Rodríguez as its new director. 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 managing 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 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 in the Central U. S. and the San Francisco Bay Area, disaster recovery in Charleston, South Carolina and Santa Cruz, California, 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.

More recently, DRC engaged in a study of the organizational response to the September 11, 2001 World Trade Center (WTC) disaster. Two days after the attacks, DRC deployed a field-team to New York City and researchers spent much of the next two months observing response activities at key facilities such as the emergency operations center and incident command post meetings near Ground Zero. They have since returned to conduct interviews with key decision-makers and are exploring the development and coordination of multi-organizational response networks, the implementation of strategies for managing the response to the WTC Disaster, and the achievement of resilience through complex networks and strategies.

DRC is also participating in a collaborative and multi-disciplinary project focusing on emergency weather warnings, the development of new technologies, and their relationship to disaster

preparedness and response. The NSF's Directorate for Engineering recently funded the proposal for the establishment of a new Engineering Research Center (ERC), the Center for Collaborative Adaptive Sensing of the Atmosphere (CASA), a joint venture between engineers, meteorologists, computer and atmospheric scientists, and social scientists, with supporting partners drawn from government, industry, and other institutions of higher education. This project is housed at the University of Massachusetts-Amherst. CASA will focus its efforts on the development of revolutionary sensing technology that will enable earlier and more accurate forecasts of weather emergencies.

A current DRC project examines the operation of Urban Search and Rescue task forces during various disaster-related deployments to determine the extent to which these task forces have been impacted by the problems known to be characteristic of search and rescue operations, the solutions they have developed in response to these problems, and the ways that these task forces foster relationships with volunteers and local, state, and federal organizations during major disaster-related deployments.

Finally, another current DRC project, in collaboration with engineers and computer scientists at the University of Rhode Island, involves 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. The models incorporate social science knowledge of social behavior in emergency evacuations to capture the naturally occurring interactions between the pedestrian evacuees, the environment, and the evacuation policies and controls implemented.

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 50,000 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 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, and the U.S. Geological Survey. Major research funding is currently provided by grants from the National Science Foundation, the Federal Emergency Management Agency, and the Multidisciplinary Center for Earthquake Engineering Research, and the Public Entity Risk Institute.

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

Disaster Research Center Personnel

Research Staff

Havidan Rodriguez, Director (August 2003 – Current)
Kathleen J. Tierney, Director (2000 – August 2003)
Benigno Aguirre, Senior Faculty Associate
Joanne M. Nigg, Faculty Affiliate
Russell R. Dynes, Professor Emeritus
E. L. Quarantelli, Professor Emeritus
James M. Kendra, Research Coordinator (2001 – 2003)
*Tricia Wachtendorf, Field Director (2000 – 2003),
Research Coordinator (2003 – Current)*
Brian Monahan, Field Director (2003 – Current)

* * * *

Administrative Assistant

Natalie Lamoreau

* * * *

Graduate Research Assistants

Victor Argothy
Rory Connell
William Donner
Milton Melendez
Gabriel Santos
Xuewen Sheng
Joseph Trainor

* * * *

Information Technology Staff

Evan Shows
Yohannes Tesfaye

Undergraduate Research Assistants

Lavelles Augustin

Allison Capo

Tina Diablo

Brynn Girten

Alayna Jehle

Carla MacKenzie

Liana Mechali

Annie Tanverdi

Carl D. Bernard III

Jill Cope

Wendy Garcia

Desiree Grainger

Robert Justiniano

Sean Marsula

Carla Russell

Resource Collection Staff

Pat Dunham - Coordinator

Christine Bush - Undergraduate Assistant

2003 Publications

Articles and Book Chapters

Aguirre, Benigno

“Editor's Introduction, in Special Issue in Comparative Emergency Management.”
International Journal of Mass Emergencies and Disasters 20(3): 289-292. Reprinted in Special Issue,
The Australian Journal of Emergency Management 18(2): 72-73.

“Response.” *International Journal of Mass Emergencies and Disasters* 20(2): 139.

“Social Control in Cuba.” *Latin American Politics and Society* 44(2): 67-98.

Bruneau, M., S. E. Chang, R. T. Eguchi, G. C. Lee, T. D. O'Rourke, A. M. Reinhorn, M. Shinozuka, K. Tierney, W. A. Wallace, and D. von Winterfeldt

“A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities.” *Earthquake Spectra* 19: 733-752.

Gutierrez, J. and Havidan Rodriguez

“La Investigacion Social Aplicada y los Desastres Naturales” (“Applied Social Research and Disasters”). Reprinted in Sonia Ruiz (ed.), revised edition of *Themes in the Social Sciences*. Publications Office, College of Arts and Sciences, University of Puerto Rico-Mayaguez.

Dynes, Russell R.

“Finding Order in Disorder: Continuities to the 9/11 Response.” *International Journal of Mass Emergencies and Disasters* 21(3).

“Noah and Disaster Planning: The Cultural Significance of the Flood Story.” *Journal of Contingencies and Crisis Management* 11(3).

Kendra, James M., and Tricia Wachtendorf

“Creativity in Emergency Response after the World Trade Center Attack.” Pp. in *Beyond September 11th. An Account of Post-Disaster Research*. Special Publication #39 Natural Hazards Research and Applications Information Center, University of Colorado, Boulder, CO.

“Elements of Resilience After the World Trade Center Disaster: Reconstituting New York City's Emergency Operations Centre.” *Disasters* 27(1): 37-53.

“Reconsidering Convergence and Converger Legitimacy in Response to the World Trade Center Disaster.” Pp. 97-122 in Lee Clarke (ed.) *Research in Social Problems and Public Policy*. Elsevier Science Ltd.

Kendra, James. M, Tricia Wachtendorf and E.L. Quarantelli

“The Evacuation of Lower Manhattan by Water Transport on September 11: An Unplanned ‘Success’.” *Joint Commission Journal on Quality and Safety* 29(6): 316-318.

Rodriguez, Havidan

“Por que los Desastres No Son “Naturales”?: Riesgo, Vulnerabilidad y Desastres en el Contexto Puertorriqueno.” (“Why are disasters not “natural?” Risk, Vulnerability, and Disasters in the Puerto Rican Context”). Reprinted in Sonia Ruiz (ed.), revised edition of *Themes in the Social Sciences*, (2003). Publications Office, College of Arts and Sciences, University of Puerto Rico-Mayaquez.

Tierney, Kathleen J.

“Disaster Beliefs and Institutional Interests: Recycling Disaster Myths in the Aftermath of 9-11.” Pp. 33-51 in Lee Clarke (ed.) *Terrorism and Disaster: New Threats, New Ideas. Research in Social Problems and Public Policy, Vol. 11*. Elsevier Science Ltd.

Webb, Gary R., Kathleen J. Tierney, and James M. Dahlhamer

“Predicting Long-Term Business Recovery from Disaster: A Comparison of the Loma Prieta Earthquake and Hurricane Andrew.” *Environmental Hazards* 4: 45-58.

Miscellaneous Report

Quarantelli, E. L.

“Urban Vulnerability to Disasters in Developing Societies: The Need for New Strategies and for Better Applications of Valid Planning and Managing Principles.” Newark, DE: University of Delaware Disaster Research Center.

Other Publications

Trainor, Joseph E.

“Reflections of a 1st year DRC Graduate Student.” *Unscheduled Events* 21(3): 8-9.

New Preliminary Papers

Aguirre, Benigno

“Homeland Security Warnings: Lessons Learned and Unlearned.”

“Los Desastres en Latinoamerica: Vulnerabilidad y Resistencia.”

Argohty, Victor

“Framing Helping Behavior in a Consensus Crisis: Mass Media Coverage on Volunteers in the 9/11 Response.”

“Perceptions on Acceptable Levels of Performance of Different Elements in the Built Environment in the Event of a Major Earthquake.”

Dynes, Russell R.

“The Lisbon Earthquake in 1755: The First Modern Disaster.” (Revised version of Preliminary Paper #255)

Quarantelli, E.L.

“A Half Century of Social Science Disaster Research: Selected Major Findings and Their Applicability.”

“Programs and Policies that Ought to be Implemented for Coping with Future Disasters.”

M.A. Thesis

Donner, William

“The Human Ecological Model and its Application to Severe Weather Phenomena:
Predicting Tornado Morbidity.” Department of Sociology, University of Delaware, Newark,
DE.

Presentations in Professional/Scientific Conferences

Argothy, Victor

“Perceptions on Acceptable Levels of Performance of Different Elements in the Built Environment in the Event of a Major Earthquake.” Invited Presentation for the 3rd Workshop for Comparative Study on Urban Earthquake Disaster Management, Kobe, Japan, January 30.

“Framing Helping Behavior in a Consensus Crisis: Mass Media Coverage on Volunteers in the 9/11 Response.” Presentation at the Eastern Sociological Society 73rd Annual Meeting, Philadelphia, PA, March 2.

Dynes, Russell R.

“Finding Order in Disorder.” Presentation at the Eastern Sociological Society 73rd Annual Meeting, Philadelphia, PA, March 2.

“Disaster and Development: From Economic Development to Regime Change.” Research Committee on Disaster, International Sociological Association, Atlanta, GA, , August 18.

“Lisbon: The First Modern Disaster.” Presentation at East-Central American Society for Eighteenth-Century Studies, University of Pittsburgh at Greensburg, October 2.

Kendra, James M. and Tricia Wachtendorf

“Emergence and Convergence in the Post-Disaster Environment: Recent Research Perspectives.” Invited Presentation at National Disaster Medical System Conference, March 12, Reno, NV.

“Inter-organizational Response to the World Trade Center Attack: Lessons Learned.” Presented at the Annual World Conference On Disaster Management, Toronto, Canada, June 23.

Quarantelli, E. L.

“Human Behavior in Crises: Similarities and Differences in a Bio-Terrorist Occasion.” Presentation at DIMCAS Working Group on Modeling Social Responses to Bio-terrorism Involving Infectious Agents Workshop, Center for Discrete Mathematics and Theoretical Computer Sciences, Rutgers University, May 29.

“A Social Science Research Agenda for the Disasters of the 21st Century.” Presentation at NATO/Russia Advanced Workshop on Forecasting and Preventing Catastrophe, Aberdeen University, Scotland, June 2-6.

“New Disasters and Crises of the 21st Century: Implications for Planning and Managing.” Presentation at Disaster Abatement Symposium, Delft University, The Netherlands, September 17.

Rodriguez, Havidan

“Communicating Seismic Risk: A Multidisciplinary Approach.” Presentation at the Seismological Society of America 2003 Annual Meeting, San Juan, Puerto Rico, April 29-May 2.

Santos, Gabriel A.

“Who Will Help Us? Groundwork for a Critical Analysis of Religion, Politics, and Disaster.” Presented at the Eastern Sociological Society Conference, March 2.

“Ideology, Rhetoric, and Manufactured Collective Behavior in the Tobacco Industry.” Presented at the Eastern Sociological Society Conference, March 2.

“Honor or Equality: The Sicilian Mafia, Liberalism, and Structures of Authority.” Presented at the 2nd General Session of the European Consortium for Political Research, University of Marburg, Germany, September 19.

Tierney, Kathleen J.

“Conceptualizing and Measuring Organizational and Community Resilience: Lessons from the Emergency Response Following the September, 2001 Attack on the World Trade Center.” Paper presented at the Third Comparative Workshop on Urban Earthquake Disaster Management, Kobe, Japan, January 30-31.

“Civil Society as an Asset During a Public Health Emergency.” Invited panel presentation, conference on “The Public as an Asset, Not a Problem: A Summit on Leadership During Bioterrorism,” sponsored by the Johns Hopkins University Center for Civilian Biodefense Strategies, Washington, D. C., February 3-4.

“Public Information and Risk Communication in Crises.” Invited panel presentation, panel conference on “Security, Technology, and Privacy: Shaping a 21st Century Public Information Policy.” Georgetown University Law Center, Washington, DC, April 24-25.

Disaster-Related Academic & Professional Activities

Aguirre, Benigno

President. Research Committee on Disasters, International Sociological Association.

Book Review Editor. *Natural Hazards Review*.

Reviewer. "The Nation's Fire Safety and Security." A Report of the National Research Council, Washington, DC.

Special Issue Editor. "Editor's Introduction, in Special Issue in Comparative Emergency Management." *International Journal of Mass Emergencies and Disasters* 20(3): 289-292. Reprinted in Special Issue, *The Australian Journal of Emergency Management* 18(2): 72-73.

Kendra, James M.

Panelist. "The Emergency Manager of the Future. The Next Generation." The National Academies, Disasters Roundtable. Washington, D.C., June 13.

Quarantelli, E. L.

Consultant on Hazards and Disaster course for FEMA Higher Education Project at the National Training Center.

Member. Recommending Committee for Flood Symposium in 2004. The Netherlands.

Manuscript Reviewer. *Disasters: An International Journal, Environmental Hazards, Natural Hazards Review, Risk Management: An International Journal*.

Participant. Electronic course on Disaster Research Methods at the Institute for Emergency Preparedness at Jacksonville State University, March 28.

Participant. EU/US Crisis Management Conference, Syracuse University.

Proposal Reviewer. US-Israel Bi-national Science Foundation.

Review in *Contemporary Disaster Review* (an electronic journal) V-1 No.1 of State of Emergency video.

Rodriguez, Havidan

Organizer/Presider. "Disaster Session." American Sociological Association 2003 Annual Meeting, Atlanta, GA.

Co-PI/Researcher, with Walter Díaz (Social/End-User Component), “Center for Collaborative Adaptive Sensing of the Atmosphere (CASA).” Funded by the National Science Foundation. ERC collaborative project between the University of Massachusetts-Amherst (David J. McLaughlin, PI), Colorado State University, the University of Oklahoma, and the University of Puerto Rico-Mayagüez (2003-current).

Principal Investigator. “Population Composition, Geographic Distribution, and Natural Hazards: Vulnerability in the Coastal Regions of Puerto Rico.” Funded by the University of Puerto Rico, Sea Grant College Program (with Walter Díaz and Aurelio Mercado, 2003-current).

Co-Principal Investigator. “Puerto Rico Tsunami Warning and Mitigation Program”. Funded by the Federal Emergency Management Agency (FEMA) (2001-2003; with Aurelio Mercado and Christa von Hillenbrandt).

Tierney, Kathleen J.

Member. Leaders Working Group on Biodefense, Johns Hopkins Center for Civilian Biodefense Strategies.

Contributing Author. “Integrated Research in Risk Analysis and Decision Making in a Democratic Society.” Proceedings of a National Science Foundation Workshop held July 17-18, 2002. Arlington, VA: National Science Foundation.

Member. Project Management Committee, Federal Emergency Management Agency/National Institute of Building Science Independent Study to Assess Savings Resulting From Mitigation Activities Nationwide.

Contributing Author. “Securing Society Against Catastrophic Earthquake Losses: A Research and Outreach Plan in Earthquake Engineering,” Oakland, CA: Earthquake Engineering Research Institute.

Trainor, Joseph E.

Consultant, East Fallowfield, PA, Department of Emergency Services, Assisted East Fallowfield Township, PA in replacing an out dated emergency operations plan with a new "All Hazards" plan. Additionally, Joe also provided the framework and supporting documentation for the township to develop a resource and contact database that, through a resolution that has already passed, will be updated bi-annually. The database will be used to expedite the process of locating personnel, resources, and "at risk" residents when a disaster situation presents itself.

Other Professional Activities

Aguirre, Benigno

Editorial Board. *Journal of Marriage and the Family*, *Contemporary Sociology*, and *Social Science Quarterly*.

Contributing Editor. *Handbook of Latin American Studies*, Sociology of the Caribbean and the Guianas Section, (Vol. 55 and subsequent volumes).

Member. NSF Dissertation Improvement Award Committee, NSF Sociology Program.

Dynes, Russell R.

Presented by the International Sociological Association Research Committee on Disaster The E. L. Quarantelli Award for Contributions to Social Science Disaster Theory "For his astute work over the decades on theoretical aspects of disasters and related crises, particularly his willingness to challenge, using a sociological framework, traditional and accepted ideas." Atlanta, GA, August 18.

Presented by the Department of Sociology, University of Tennessee, "Outstanding Alumni Award," Knoxville, TN, May 2.

Quarantelli, E. L.

Member. Electronic Selection Program for Visiting Professors, Italian Ministry of Universities.

Participant. Expert on Electronic Panel for Water Security Study by the U.S. Government Accounting Office.

Rodriguez, Havidan

Co-principal Investigator. "Collaborative Project on Integrating Census Data Analysis into the Curriculum." Funded by the National Science Foundation (May 2001-2004; with Felice J. Levine (PI) and Carla Howery (Co-PI), American Sociological Association).

Elected Chair of the American Sociological Association's Latina/o Sociology Section.

Principal Investigator. "Minority Access to Research Careers (MARC): Evaluation of Outcomes and Processes." Funded as part of the MARC Program to the National Institutes of Health. (2001-2003).

Proposal Reviewer. National Science Foundation.

Member. Social and Behavioral Sciences Research Experience for Undergraduates (REU) Special Emphasis Advisory Review Panel, National Science Foundation.

Member. Advisory Board, Professional Exchange for Applied Knowledge (PEAK) Program, Population Fellows Program, School of Public Health, University of Michigan.

Member. Advisory Board, Population Fellows Program, School of Public Health, University of Michigan.

Visiting Scholar. University of Michigan-Ann Arbor. Population Fellows Program, School of Public Health.

Santos, Gabriel A.

Discussant. Panel entitled “Interdisciplinary Research on Organized Crime” at the 2nd General Session of the European Consortium for Political Research, University of Marburg, Germany, September 19.

Tierney, Kathleen J.

Member. National Construction Safety Team Advisory Committee, National Institute of Standards and Technology

Trainor, Joseph E.

Honored Guest, Center for Disaster Research and Education Press Announcement, Millersville, PA , September 12.

Current and Recent Research Projects

Organizational and Community Resilience in the World Trade Center Disaster. 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. This study is being conducted with support from the National Science Foundation and the Multidisciplinary Center for Earthquake Engineering Research.

Anticipating Emergency Management Needs in Large Scale Community Crisis: Lessons Learned from the World Trade Center Attack and Other Major Disasters. This study is designed to address the need for improved management of large-scale and near-catastrophic disasters, including both natural disasters and those originating from intentional acts, such as terrorist attacks. This study, which complements the World Trade Center project described above, involves the collection and analysis of data on the World Trade Center attack in New York City as well as a review of findings from research on other near-catastrophic disaster events. The study which is being conducted under the sponsorship of the Public Entity Risk Institute (PERI), is designed to produce guidance that can be used by jurisdictions throughout the U.S. as they develop and modify their plans for coping with community wide crises.

Technology, Weather Forecasts, and Warnings: Integrating the End-User Community. Social Scientists at DRC and CISA are contributing to the research efforts of 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 every-day and extreme weather events. Specifically, through the use of survey methodology and focus groups, we are examining how the end-user community, particularly emergency managers, 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 on 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? We have already initiated the data collection process in the state of Oklahoma; we will then collect similar types of data in Texas and Puerto Rico.

Study of Warning and Response to Tornadoes. The Disaster Research Center proposes to make a quick-response field reconnaissance trip for a preliminary study of the emergency response to the May 5, 2003 series of tornadoes in Missouri and Oklahoma. We intend to study the warning system, the response of the emergency management and hospital systems to the storms, and the effects of Project Impact on the ability of cities to mitigate the effects of the storms.

The Methods that will be employed will be ethnographic observation and informal interviews with key personnel in the hospitals, the city administrations involved with mitigation, and the emergency management communities (police, fire, emergency management agency), as well as the collection of documents and local mass media accounts of the disasters.

The research addresses important goals of the NSF. It will allow us the rare opportunity to go back to cities that DRC has studied in the past with NSF funding, to test previous findings on warning systems, hospitals, the responses of the emergency management communities, and the effectiveness of FEMA's Project Impact.

FEMA'S USAR Taskforce Deployments: Implications For the Management of Emergency Response.

The Urban Search and Rescue taskforces (USAR) sponsored by FED'IA, a key component of the federal emergency response system, are examined to determine the: A. 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 B. 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.

Behavioral and Model of Pedestrian Dynamics. 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. F. 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.)

Disaster Research Center Field Studies

January 26-28

*Rory Connell and William Donner,
Raleigh, NC, Conducted interviews for
FEMA Project Impact Year 4.*

May 8-13

*James M. Kendra, Jackson, TN,
Quick response research following
the Jackson Tornado.*

June 6-10

*Benigno Aguirre and William Donner,
Oklahoma City, OK, Research
Following the Oklahoma City
Tornado.*

October 7-9

*Havidán Rodríguez and Walter Díaz
(University of Puerto Rico-Myagüez),
Tulsa, OK, Administer surveys
to emergency management personnel.*

October 10-11

*Benigno Aguirre, Brian Monahan,
and Joseph E. Trainor, University of
Rhode Island, Kingston, RI,
Pedestrian simulation study.*

Multiple Site Visits

*Tricia Wachtendorf and James M.
Kendra, New York City, NY, In-depth
interviews with key decision-makers
and responders regarding the World
Trade Center Disaster.*

Visitors to DRC

Canada

Joseph Scanlon - Carleton University, October 6-9.

Italy

Professor Marco Lombardi - Universita Cattolica del Sacro Cuore Dipartimento di Sociologia, February 15.

The Netherlands

A.C. Trijeselaar - City of Rotterdam, Administration Department, April 4.

U.S.A.

Margaret O'Leary, Benedictine University, July 23.

Dr. John L. Bryan - Fire Protection and Life Safety Consulting.

James V. Porto, The University of North Carolina at Chapel Hill, May 29.

Philip M. Burgess - National Academy of Public Administration.

Rachel Balsham and Dr. Peter Pry- Institute for Defense Analysis, Electromagnetic Pulse Commission, August 22.

Richard Buck, FEMA, Multiple Visits.

Henry W. Fischer III, Department of Sociology/Anthropology, Millersville University of Pennsylvania.