Annual Report
1999
Hazard Reduction & Recovery Center

The Hazard Reduction & Recovery Center (HRRC) was established within the College of Architecture at Texas A&M University in the fall of 1988. This annual report covers the HRRC's activities for the calendar year of 1999. This year marked the eleventh anniversary of the HRRC's existence.

HRRC now has three senior staff (Director, Michael Lindell; Founding Director and Senior Scholar, Dennis Wenger; and Extension Division Coordinator, David Bilbo); five technical staff members (Research Scientist, Carla Prater; Senior Research Associates, Gregory Schumann and William Sanderson; Systems Analyst, Rong Hu; and Staff Assistant, Ruth Yeager. In addition, there are four senior Faculty Fellows (Benigno Aguirre, Dale Perry, George Rogers, and Norris Stubbs), a Research Librarian (Brian Carpenter), and eight Faculty Fellows (Sherry Bame, David Ekroth, John Giardino, Charles Graham, Jon Rodiek, Daniel Sui, John Thomas, and Paul Woods). The faculty fellows have appointments (some of them joint appointments) in the departments of Landscape Architecture and Urban Planning (5), Construction Science (3), Architecture (3), Geography (2), Civil Engineering (1), and Sociology (1).

Other members of the HRRC include six Associate Faculty Fellows (Philip Berke, University of North Carolina, Chapel Hill; Bruce Hull, Virginia Polytechnic Institute & State University; Jack Kartez, University of Southern Maine; Rocky Lopes, American Red Cross; Ronald Perry, Arizona State University; and David J. Whitney, California State University at Long Beach). There were four graduate students affiliated with HRRC from the Master's program in Urban Planning (Jeff Bryan, Laurie Cummings, Choong-hyun Jeong, and Ju Chul Jung) and two from the Master's program in Construction Management (Ting-Shiuan Kwei and Jong-Tae Kim). There also were four students from the Ph.D. program in Urban and Regional Science (Kevin Grady, Seong Nam Hwang, Hee Min Lee, and Jie Ying Wu) and one from the Ph.D. program in Architecture (H. Gene Robertson).

HRRC has a ten member National Advisory Panel consisting of Raymond Burby, University of New Orleans; Thomas Drabek, University of Denver; David Gillespie, Washington University; Myra Lee, Oregon Emergency Management; Peter May, University of Washington; Kishor Mehta, Texas Tech University; Joanne Nigg, University of Delaware; William Riebsome, University of Colorado; Patrick Lavalla, The Emergency Response Institute; and Mary Fran Myers, University of Colorado.

HRRC Research Projects
HRRC continued its relationship with the United Nations Department of Humanitarian Affairs as a Collaborating Centre, and undertook projects for the National Science Foundation, and the Texas Department of Public Safety Division of Emergency Management.

Continuing Projects
Bame, S., Autenrieth, R., Donnelly, K.C., Morgan, R., Ramos, K., Richardson, B., Rogers, G., Sherman, M. ESRD and Exposure to Nephrotoxins in Drinking Water. National Institutes of Health/National Institute for Environmental Health Sciences. 06/98-06/99. $15,000.

Lindell, M.K., Principal Investigator, Adoption of Earthquake Hazard Adjustments by Households and Complex Organizations, sponsored by the National Science Foundation. 09/96–12/01, $399,775.
Schumann, G.C., Principal Investigator, 
*Publication of a Spanish Hurricane Awareness Brochure, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/98–09/99, $7,500.*

Schumann, G.C., Principal Investigator, 
*Update to the Hurricane “Estimated Safe Time for Evacuation Decisions (ESTED)” Computer Model, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/98–09/99, $600.*

Schumann, G.C., Principal Investigator, 
*Integration of Storm Surge Penetration Data Into a GIS Database, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/98–09/99, $14,000.*

Schumann, G.C., Principal Investigator, 
*Publication of Hurricane Evacuation Host Area Maps, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/98–09/99, $9,200.*

Schumann, G.C., Principal Investigator, 
*Publication of Coastal Hurricane Risk Area Maps, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/98–09/99, $4,375.*

Schumann, G.C., Principal Investigator, 
*Participation in the Activation of the State Emergency Operations Center in Response to Hurricanes, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/98–09/99, $25,000.*

Lindell, M.K., Principal Investigator, 
*Texas Hazard Analysis Information Website: Phase I, sponsored by Texas Division of Emergency Management, 07/99–09/99, $10,340.*
New Projects

Bame, S. & Richardson. B. Cancer Risk in Texas. TAMU College of Architecture. 06/99-06/00. $5000.

Lindell, M.K., Principal Investigator, Texas Hazard Analysis Information Website: Phase II, sponsored by Texas Division of Emergency Management, 10/99-09/00, $66,412.

Schumann, G.C., Principal Investigator, Update to the Hurricane Contingency Studies for all Jurisdictions on the Texas Coast, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/99–09/00, $95,000.

Schumann, G.C., Principal Investigator, Evacuation Response Behavioral Study for all Jurisdictions on the Texas Coast, Sponsored by the Texas Department of Public Safety, Division of Emergency Management. 10/99–09/00, $95,000.

HRRC Publications and Presentations
During 1999, HRRC staff produced 1 book, 1 scientific journal special issue, 9 articles in scientific journals, and 20 technical reports. In addition, the staff made 16 presentations at scientific and professional meetings.

Books, Monographs, and Book Chapters

Journal Articles and Conference Proceedings


Other Publications


Presentations


Lindell, M. K. (1999). *Correlates of Seismic Hazard Adjustment*. International Workshop on Community Hazards Awareness and Hazards Mitigation Learning sponsored by the Taiwanese National Science and Technology Program for Hazards Mitigation at National Taiwan University, Taipei Taiwan.


Prater, C.S. (1999). *Politics of Hazard Mitigation*. International Workshop on Community Hazards Awareness and Hazards Mitigation Learning sponsored by the Taiwanese National Science and Technology Program for Hazards Mitigation at National Taiwan University, Taipei Taiwan.


Professional Activities and Awards
HRRC staff have been actively involved in professional activities and several individuals have received peer recognition for their work.

Sherry Bame was a member of the NIH/CDC Scientific Review Panel.

David Bilbo accepted an appointment as the Chair of the National Disaster Education Committee for the American Red Cross. This committee recently received a $1,000,000 grant from Allstate Insurance Co. to support the development and evaluation of the "Masters of Disaster" curriculum for the public schools.

Michael Lindell served as a member of a peer review panel for the Environmental Protection Agency, Office of Research and Development and recently completed an appointment as Special Issue Editor for the Journal of Hazardous Materials. He also was appointed as a member of the Policy Committee and Secretary of the Executive Committee of the American Society of Civil Engineers Council on Natural Disaster Reduction.

Carla Prater and Michael Lindell are the Co-Chairs, and Ruth Yeager is the Staff Assistant for the Natural Hazards Researchers' Summer Workshop.

Gregory Schumann was selected to attend the 1999 Hurricane Planning Workshop, appointed to the Texas Coastal Advisory Committee, and served as Technical Consultant to State of Texas, Division of Emergency Management during Activation for Hurricane Bret. He also was appointed to the Texas Department of Transportation's Hurricane Evacuation Committee, and to its Subcommittee on Traffic Contra-flow Strategies. Finally, he was awarded the 1999 Presidential Citation from the Texas Gulf Coast Emergency Management Association and elected to the Association's Board of Governors.

HRRC Hazard Analysis Laboratory (HAL)
Under the sponsorship of the Texas Department of Public Safety Division of Emergency Management, HRRC staff have developed a Hurricane Storm Atlas. The Atlas consists of a series of maps depicting storm surge penetration, storm surge MEOWS (Maximum Envelope of Water), wind fields and high velocity zones indicating areas in which waves over three feet are possible. Also included in the Atlas are impact statements for all facilities determined to be critical or essential in an emergency, location maps illustrating the location of all facilities throughout the study area, and estimated tidal conditions resulting from hurricane landfall at various points along the coast. In addition, a Hurricane Contingency Planning Guide and two computer programs have been developed. The first program, ESTED-TX, is used to estimate the safe time remaining before evacuation decisions must be made for the Texas Coast. Another program, DERC-TX, is used to compute damage estimate ranges and casualties from hurricanes on the Texas Coast. HRRC staff have made an extensive effort to integrate GIS Database capabilities as part of these projects and will continue to do so in the coming year.

HRRC Outreach Activities
During 1999, HRRC staff were actively involved in international outreach activities. HRRC staff hosted a visit by five members of the Taiwanese National Science and Technology Program for Hazards Mitigation (NAPHM) during the Winter of 1999 and HRRC staff reciprocated twice during the Summer of 1999. NAPHM and HRRC are in the process of formalizing their relationship through a Memorandum of Agreement that will be signed by the respective center directors and university presidents.

HRRC staff also participated in the organization of a conference on "The Reconstruction and Transformation of Central America", a conference designed to assist the four countries most severely affected by Hurricane Mitch. Carla Prater and Mike Lindell are collaborating with the TAMU Latin American Studies Program to sponsor a student group to organize relief efforts and provide support to international students when their countries are struck by disasters.

Other Faculty Involvement
During the summer of 1999, HRRC managed a building safety survey of Hurricane Evacuation Shelters throughout the state of Texas. This project needed faculty members with skills in architecture, engineering, or building
construction. Two of the HRRC Faculty Fellows with relevant skills, David Ekroth and Charles Graham, served on the project. In addition, the center recruited Bruce Bateman, Richard Burt, Ifte Choudhury, Nancy Holland, and David Hudson from the Construction Science department to lead inspection teams.

**Graduate Student Development**
During 1999, two graduate students associated with HRRC completed their dissertations. Dr. Min Sun Eoh returned to Korea, while Dr. Carla Prater became a Research Scientist within HRRC. Dr. Jy-Pyung Sah, who had remained with HRRC for a year after completing his Ph.D., returned to a faculty position in Taiwan. Seong Nam Hwang finished his Master's degree in Urban Planning and continued on into the Ph.D. program.

During Spring Semester, the members of the Disaster Response Planning class conducted an appraisal of emergency preparedness at the NASA Johnson Space Center. This activity was followed up by a paid internship for one of the students (Jeff Bryan) at JSC during the summer.

During the summer, ten graduate and six undergraduate students were recruited to work on the Hurricane Evacuation Shelter Survey. Students gained field experience during their evaluation of over 350 hurricane shelters throughout the state.

Immediately before the beginning of the Fall Semester, the HRRC staff held an orientation for new and returning students. Following a crash course in disaster research and emergency management, the students were formed into teams to solve a practical emergency planning problem.

During December, Bill Sanderson organized and led a group of eight graduate students on a tour of hazards-related agencies in Washington DC and New York City. Students received information about the typical job duties and recommended course preparation for careers in these agencies.

**HRRC Library Development**
During 1999, HRRC concluded an agreement to transfer its holdings on hazards and disasters to the Evans Library as a special collection. Most of the HRRC holdings, currently totalling more than 20,000 items, will be dispersed physically throughout the stacks. Unusual items of historical interest will be transferred to the Cummings historical collection. Regardless of their physical location, all items from the HRRC Library will be listed together as a special intact collection in the Evans Library's electronic catalogue. This transfer to the Evans Library will provide a greater number of faculty and students with access to HRRC holdings.

In addition, the Evans Library established one of its Research Librarians, Brian Carpenter, as the point of contact for HRRC faculty, staff, and students. Brian has been conducting specialized training classes for HRRC faculty, staff, and students. Brian has been conducting specialized training classes for HRRC faculty, staff, and students.

**HRRC Space and Computer Resources**
During 1999, HRRC reorganized the space allocated to student workstations. The HRRC Library shelves were moved out and replaced by desks for graduate students and tables for a new conference area. This allowed the previous conference room to be converted to office space for HRRC technical staff. Four new computers, a printer, and a scanner were purchased last year, providing a computer for each of the twelve student workstations.

**HRRC Publication List**
The HRRC Publication List now includes 24 books and monographs, 218 journal articles and book chapters, 62 research reports, and 53 preliminary papers. In addition, slide collections and computer software are available from HRRC. The Center continues to receive extensive orders from the public, officials and other researchers, as well as to exchange publications with the University of Delaware Disaster Research Center, the University of Colorado Natural Hazard Research and Applications Information Center, and the United Nations Department of Humanitarian Affairs.
HRRC Web Site
The HRRC Web Site continues to undergo extensive revision. The HRRC publication list, summaries of current projects, staff vitae and selected publications are accessible from the Web <http://hrrc.tamu.edu>. In addition, we have developed an extensive listing of national and international hazards-related centers and also have established links to all 50 state Emergency Management Agency websites.

HRRC Lecture Series
During 1999, HRRC staff continued to present a series of weekly lectures on the Texas A&M campus. This year's presentations have focussed on the development of graduate students' knowledge of social and political processes relevant to environmental hazard management. In addition, the presentations have addressed the development of technical skills in the areas of interviewing, attitude theory and measurement, and statistical analysis.
Hazard Reduction & Recovery Center Personnel

Administration
- Michael K. Lindell, Center Director
- Dennis Wanger, Founding Director and Senior Scholar
- David Bilbo, Extension Division Coordinator
- Carla Prater, Research Scientist
- William Sanderson, Senior Research Associate
- Rong Hu, Systems Analyst
- Ruth Yeager, Staff Assistant

Senior Faculty Fellows
- Bariqno Aqilre, Sociology
- Dale Perry, Architecture
- George Rogers, Landscape Architecture and Urban Planning
- Norris Stubbs, Civil Engineering

Faculty Fellows
- Sherry Same, Landscape Architecture and Urban Planning
- Brian Carpenter, Evans Library
- David Etkoth, Architecture
- John Giardino, Geography
- Charles Graham, Construction Science and Architecture
- Jon Rodiek, Landscape Architecture and Urban Planning
- Daniel Sul, Geography
- John Thomas, Texas Agricultural Extension Service
- Paul Woods, Construction Science

Associate Faculty Fellows
- Philip R. Berka, University of North Carolina at Chapel Hill
- R. Bruce Hull IV, Virginia Polytechnic Institute and State University
- Jack D. Kartaz, University of Southern Maine
- Rocky Lopes, American Red Cross National Headquarters
- Ronald W. Perry, Arizona State University
- David J. Whitney, California State University at Long Beach

National Advisory Panel
- Raymond Burby, University of New Orleans
- Thomas E. Drabek, University of Denver
- David Gillespie, Washington University
- Myra Lee, Oregon Emergency Management
- Peter May, University of Washington
- Kishor Mehta, Texas Tech University
- Joanne Higg, University of Delaware
- Patrick L. Lavalla, The Emergency Response Institute, Inc.
- Mary Fran Myers, University of Colorado

Graduate Research Associates
- Jeff Bryan
- Laurie Cummings
- Kiran Darapuriddi
- Kim Gallindo
- Saritha Goll
- Bhanav Goswami
- Kevin Grady
- Seong-Nam Hwang
- Choong-Byun Jeong
- Prateek Jetty
- Ju Chul Jung
- Hee Min Lee
- Alok Mishra
- Priyanka Nathani
- Stephen Parker
- H. Gene Robertson
- Jie Ying Wu

Undergraduate Assistants
- Jonathan Betcher
- Robert Castro
- Nathan Lowe
- Kristen McFadden
- Christopher Vasquez