UNIVERSITY OF DELAWARE

DRC

Disaster Research Center

2013 ANNUAL REPORT

DISASTER RESEARCH CENTER

OFFICE OF RESEARCH / COLLEGE OF ARTS AND SCIENCES

UNIVERSITY OF DELAWARE

2013 Annual Report

James Kendra, Director
Tricia Wachtendorf, Associate Director

Benigno Aguirre, Core Faculty
Rachel Davidson, Core Faculty
Earl (Rusty) Lee, Core Faculty
Sue McNeil, Core Faculty
Joanne M. Nigg, Core Faculty
Joseph Trainor, Core Faculty

Russell R. Dynes, Founding Director, Professor Emeritus
E. L. Quarantelli, Founding Director, Professor Emeritus

Deb Alvarez, Affiliated Faculty
Scott Knowles, Affiliated Faculty
Eric Stern, Affiliated Faculty

Telephone: (302) 831-6618
FAX: (302) 831-2091
Email: drc-mail@udel.edu
DRC website: www.udel.edu/DRC

DRC Staff

Vicky Becker, Business Administrator
Gail Kracyla, Administrative Assistant

Pat Young, Resource Collection Coordinator
Taylor Mazzarella, Resource Collection Undergraduate Assistant
Fallon Mosia, Resource Collection Undergraduate Assistant
Leslie Quispe, Resource Collection Undergraduate Assistant

Demetrius Pinder, Information Technician

Kimberly Gill, Post-doctoral Researcher
Xiaojun Shan, Post-doctoral Researcher

Graduate Research Assistants

Eric Best
Rochelle Brittingham
Ryan Burke
Anthony Cario
Hans Louis Charles
Lauren Clay
Alex Greer
Sarah Gregory
Jennifer Lazo
Nuno Martins
Danielle Nagele
Margaret Nelan
Jiazhen Peng
Samantha Penta
Ben Wallace
Daryl Yoder-Bontrager

Undergraduate Research Assistants

Lindsay Arndt
Thomas Atadan
Chelsea Barry
Matthew Cory
Dana DiGennaro
Kristen Dukes
Courtney Flynn
Katrina Gearhart
Brendan Gill
Justin Kirk
Shayne Larkin
Eric Linde
Monica Marciszewski
Precious Morris
Karly O'Brien
Marguerite O'Leary
Marrisa Personette
Kelley Philbin
Peter Rebuck
Luke Schneider
Abigail Scout
Brinda Shah
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Peter Shaw
Ryan Wibbens
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Emily Winston
Amy Wolpert

DRC Annual Report Editorial Staff

Pat Young
James Kendra

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Disaster Research Center (DRC)

The Disaster Research Center was established in 1963 and now, fifty years later, DRC is celebrating its continued success in research, training and service to the disaster community. DRC was established at The Ohio State University in 1963 by Professors E.L. Quarantelli, Russell Dynes and J. Eugene Haas and moved to its current location at the University of Delaware in 1985. The Center was the first in the world devoted to the social scientific study of disasters.

Historically, DRC has conducted field interviews and extended research projects on group, organizational, and community preparation for, response to, and recovery from natural and technological disasters and other community-wide crises. While much of the research at DRC has been interdisciplinary throughout its existence, DRC has embarked on a new era as the Center builds on and maintains its foundation in social science while broadening its activities to embrace more explicitly interdisciplinary, multidisciplinary and cross disciplinary research. Graduate and undergraduate training has been an integral component of DRC's mission. 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. All DRC research is intended to yield both basic scientific knowledge on disasters and information that can be applied to develop more effective plans and policies to reduce disaster impacts.

For more information, consult DRC's home page at **www.udel.edu/DRC**, find us on Facebook at **https://www.facebook.com/disasterresearchcenter** and follow us on Twitter at **https://twitter.com/UDELDRC**

Director's Message

Dear DRC Alumni, Staff and Friends,

We are pleased to present the 2013 Annual Report in which we provide a summary of our activities over the past year.

It was a year filled with new research, celebrations and, of course, challenges. While Delaware was spared the worst of Hurricane Sandy in 2012, the millions of people seriously impacted by the storm continued to engage in a difficult recovery process in 2013. DRC fielded research teams throughout the affected area, pursuing topics that align with our interdisciplinary work, including personal and material convergence, emergence, and emergency preparedness in hospitals and nursing homes. The East Coast was not the only area to see the impact of natural disasters in the recent past. This past year Oklahoma also experienced post-event devastation resulting from tornadoes that struck the state. DRC was there as well, conducting field research looking at donations, volunteers and provision of disaster behavioral health services.

On a brighter note, DRC has excellent news to report. We received several anonymous but extremely generous gifts which provided transformational support. One anonymous gift allowed DRC to continue to expand the E. L. Quarantelli Resource Collection and to improve our capacity for archiving and preserving older or delicate materials and modernizing the cataloguing infrastructure. Other generous gifts supported research assistantships and quick-response fieldwork. Our educational dimension may not be as well-recognized outside of the circle of DRC alums and friends as our research, but education in disaster science and research methods is a principal activity at DRC and these gifts bolstered our ability to offer that experience to students outside of funded projects.

Meanwhile, Drs. Tricia Wachtendorf, Rachel Davidson and Joseph Trainor were, and continue to be, part of large-scale partnerships that were awarded the highly prestigious Hazards SEES grants (Science, Engineering and Education for Sustainability) from the National Science Foundation. These projects emphasize multidisciplinary research on some of the most demanding questions in the hazards and disasters area and integrate the work of social, engineering and physical sciences. This project is just one example of the cutting edge research that continues to take place here at DRC.

We hope that 2013 was a prosperous year for you. As always, you can stay up-to-date on the latest happenings at DRC via our bi-annual e-newsletter the DRC Dispatch. Register for DRC communications on our website: **drc.udel.edu**.

Best wishes,
Jim Kendra

Research

DRC has a well-established research tradition built on its foundations in the social sciences, a proven capacity for quick response field research, and a culture of collaboration between faculty, staff, and graduate and undergraduate students. A number of recent events and policy developments have created not only an increased demand for DRC's traditional expertise, but have also provided motivation to go beyond multidisciplinary work to develop a sustainable interdisciplinary program. These include the increase in focus on challenges related to disasters, the multidisciplinary funding climate, emerging collaborations between DRC and external agencies, and the many unfunded mandates related to disaster planning that have been imposed on governmental agencies. All have converged to further support and encourage DRC's efforts to establish a strong interdisciplinary research environment. In developing such an environment, DRC draws on the core research areas of current DRC faculty, all of which are prime for interdisciplinary collaboration, including:

- The identification of the social, physical and environmental factors/conditions that influence vulnerability and resilience of social and physical systems
- Individual and collective threat perception and behavior
- Organizational and inter-organizational dynamics
- Development and disasters
- Social and political dynamics that enhance the development of public policy for disaster reduction
- Analysis and management of infrastructure systems

In developing and conducting research projects, DRC acts as a catalyst for and serves as the intellectual home for interdisciplinary disaster-related research. Our integrated project teams leverage the interests and capacities of other disciplines on campus that balance quantitative and qualitative approaches to research, that demonstrate systems-level thinking, that employ the broadest possible set of methodologies and analytic techniques, and that nurture a culture which values the integration of disciplinary insights and thinking.

Project Descriptions

This section provides brief descriptions of newly initiated, active, and recently completely projects involving faculty from the Disaster Research Center at the University of Delaware. Although by no means an exhaustive list of capabilities, these projects demonstrate the Center's expertise and our current agenda.

Projects Initiated in 2013

Department of Defense Dual Status: SSI

Principle Investigator: Sue McNeil
Graduate Research Assistant: Ryan Burke
Funding Agency: U.S. Department of Defense

The role of the military during homeland defense and civil support operations has significant strategic implications for U.S. homeland defense and national security efforts. Considerations for the future employment of American ground forces during missions in the homeland has evolved into a major topic of conversation among policy makers and military strategists alike. In this context, there is a philosophical conflict between federalism and state sovereignty during military civil support missions that continues to present itself as an impediment to success. Balancing the institutionally divergent approaches to achieve a unified, efficient, and effective response continues to prove problematic. The contingency dual status command initiative is the proposed solution to this notable challenge. However, there are numerous gaps in the available dual status command guidance leading to increased complexity and confusion during contingency operations in the homeland. This project will build on our proposed case study examining the contingency dual status command arrangement during Hurricane Sandy. Using the data collected during this case study as a basis for continued analysis, we will employ process improvement modeling techniques to create a structured representation of the dual status command process. This process model will identify specific goals, practices, and key requirements of contingency dual status command operations in order to provide a tool to assist leaders and decision makers during these complex management challenges. Process improvement modeling techniques can provide a unique way to examine the contingency dual status command arrangement and develop a structure for improving these complex operations. The proposed process model will contribute to the evolving dual status command discussions and will provide a practical tool for improving the efficiency and effectiveness of this critical military mission capability well into the future.

Department of Defense Unity of Effort SSI

Principle Investigator: Sue McNeil
Graduate Research Assistant: Ryan Burke
Funding Agency: U.S. Department of Defense

The objective of this project is to provide analysis and policy recommendations for the improvement of Defense Support of Civil Authorities (DSCA) operations under the Dual Status Commander (DSC) construct during no-notice complex events such as Hurricane Sandy. In order to develop such recommendations, we intend to conduct a rigorous examination of Hurricane Sandy and the corresponding military response under Joint Task Force (JTF) Sandy in New York as a case study.

Evolution of Culture

Principal Investigator: Joseph Trainor
Graduate Research Assistant: Danielle Nagele
Funding Agency: National Science Foundation

Thousands of natural hazards affect the United States each year, many resulting in loss of life, injuries, and damaged property. These hazards make obvious the need for an effective warning system with the ability to reduce

losses. Even so, no single agency "owns" public notifications and warnings. Given the many organizations involved in this activity, those who study warnings often refer to the webs of warning organizations involved in local areas as a "warning system." Further there is often a call for "integrated warning systems" or networks that work together and understand how their policies and activities interact with those of other warning systems (Quarantelli, 1990; Nigg, 1995; and Sorenson, 2000.) These warnings systems are quite complex and can be thought of as the actors, resources, and processed involved in detection, prediction, and communication of impending disasters. Such a complex system requires the involvement of many different actors and organizations interacting with one another. Understanding the way that the warning system works and the interactions between each component is imperative if we are to determine what is effective and what needs to be improved. The proposed research will explore a conceptual model of the warning system in order to extend our understanding of the organizations and tasks involved. In addition, this analysis will examine the inter- and intra-organizational variations that can arise among warning systems in different regions. Building on the idea of disaster subculture, we propose that repetitive impacts from the same hazard can lead to changes in the communication structure, the roles and influence of the actors, and the available resources and their uses.

Hazards SEES Type 2: Dynamic Integration of Natural, Human, and Infrastructure Systems for Hurricane Evacuation and Sheltering

Principal Investigator: Rachel Davidson and Tricia Wachtendorf
Funding Agency: National Science Foundation

This project will improve understanding of and decision support for hurricane evacuation and sheltering. Despite notable progress in research and practice, growing coastal populations, limited road capacity, and climate change suggest that many challenges remain. The three features of hurricane events that are perhaps most important for understanding evacuation and sheltering are that they: (1) are dynamic, (2) involve great uncertainty, and (3) include many interactions within and among the natural, infrastructure, and human systems. Previous study and modeling of hurricane events have not fully captured these features, inhibiting our ability to fully understand them and effectively and efficiently manage them. Traditionally, researchers have decoupled the main pieces of the analysis. A single, conservative map of storm surge flooding defines the evacuation zone, which is the basis for subsequent static analysis of the infrastructure (e.g., which roads will be closed) and resident behavior (who will leave, when, and how), and dynamic analysis of traffic. We propose a fundamentally new approach in which we model the hazard using a set of probabilistic scenarios that describe the range of ways a hurricane may evolve. For each hurricane scenario, we will develop storm surge, wind speed, and rainfall flooding maps at each time step. We will also model the dynamic decision-making of emergency managers and residents as the available information changes, and the dynamic movement of residents over the course of the event. Overlaying the results of these models will help understand the interactions within and among the systems through space and time. The project has 4 main steps. First, we will implement an integrated meteorological, hydrologic, and hydraulic modeling system to determine a set of probabilistic ensemble scenarios for an offshore hurricane. Second, we will develop theoretical models of resident and emergency manager temporal decision-making. Third, we will develop a multistage stochastic program that integrates the outputs from the first two steps to support emergency managers' hurricane evacuation and sheltering decisions so as to minimize personal risk and travel time. Finally, we will demonstrate the interconnected hazard, behavioral, and evacuation/shelter models through case study applications in North Carolina.

Towards a Community Resilience Index

Principal Investigator: James Kendra
Funding Agency: Centers for Disease Control and Prevention

The CRI is intended to be used as a *predictor*, pre-event, of peri- and post-event resilience. As described here, our CRI is referred to as the *Composite of Post-Event Well-being*, or CoPE-WELL. It is a population-based index or composite score of community resilience. The CoPE-WELL model has been developed with CDC support to identify (1) community vulnerabilities to help mitigate the impact of natural or man-made public health threats and disasters, and (2) community indicators for resiliency that can be strengthened to help local communities better recover. The fundamental impetus for the work is to inform efforts to increase community preparedness, response, recovery, and resilience through mechanisms that can be affected by public health and community organizations, healthcare systems, and other entities that interact broadly with public health systems in general, and with the public health emergency preparedness system (PHEPS) in particular.

The Layers of Disaster Recovery: Capturing Meaning through the Eyes of Survivors

Principal Investigator: Tricia Wachtendorf
Funding Agency: University of Delaware Center for Global Studies, Global Scholars Award

This project emphasizes the value in intersecting humanities and social science approaches, placing art and visual sociology alongside established research findings to explore the multiple layers of disaster recovery. Leveraging the University of Delaware Global Scholars Award with additional support from Japan's Tokyo Kasei University, this case study of individuals affected by the 2011 radiation release Fukushima, Prefecture involves the exploration of the difficult task of determining a consensus on recovery goals and outcomes, be it within a community, between segments of the community, and even within individuals.

SEES Proposal: Next Generation, Resilient Warning Systems for Tornados and Flash Floods

Principal Investigator: Joseph Trainor
Funding Agency: National Science Foundation

The goal of this project is to research, develop, implement, and evaluate an end-to-end severe weather warning system which aims to save life and property by communicating targeted, actionable information to the concerned public. The integrated severe weather warning system encompasses real time sensor observations, forecasts, threat assessment, decision-making, warnings and alerts, communications, and public perception and response that ultimately results in increased sustainability in the case of severe weather hazards.

New observation systems like the CASA radar sensor network provide improved weather information and have the potential to improve warning and forecasts for severe weather hazards like tornados, severe thunderstorms, hail, and flash flooding. While major improvements have been made on the sensing and forecasting side in recent past, communicating effective warning information on weather hazards over appropriate channels to the public still remains an open issue. It is our goal to clearly identify the existing issues and develop new solutions with an interdisciplinary team of researchers from social science, engineering, computer science, and atmospheric science. The collaboration between social and behavioral scientists on one side and engineers and natural scientists on the other side will aim at creating effective, actionable warning messages that reach individuals independent of their current location, type of communication device, and state of the communication infrastructure.

To evaluate our new approach of a sustainable severe weather warning system we will make use of the CASA Dallas/Fort Worth Urban Demonstration testbed. This

allows us to perform end-to-end research with real end users and real (most likely severe) weather. There are several advantages of performing the proposed research and development within the scope of the DFW testbed. The most important one is that partnerships with local NWS forecasters, regional emergency managers, and local TV stations have already been established. This will allow us collaborate with these groups right from the beginning of the project. In addition to the DFW testbed we will leverage our involvement in the NSF GENI, US Ignite, and FIA initiatives to incorporate state of the art research and testbeds in the area of communication networks.

Professor Trainor will serve as a Co-Pi on this proposal and will oversee the project at UDEL. Trainor will work with the researchers at the other collaborating institutions to provide social science insights and methodological conventions to this grant. In particular, he will help develop the Integrated Warning Framework. Further he will, with the assistance of his students, help to design, conduct, and analyze original research in the integrated warning live experiments. This work will include mobile surveys, focus groups, and narrative analysis including sampling, data quality, instrument design, participant recruiting, and analysis. Dr. Trainor will also be part of the team developing the parameters and data collection processes for gathering behavioral response data using the proposed mobile phone application. Finally, he will also help to develop the mixed methodological approach for integrating quantitative results from the live experiments and more focused qualitative data so that insights will influence the evolution of the project across yearly iterations.

Promoting Community Resilience in New York City after Hurricane Sandy: A Model-based Approach

Principal Investigator: James Kendra
Graduate Student Assistants: Sarah Gregory, Hans Louis-Charles, Nuno Martins
Funding Agency: United States Department of Health and Human Services

Johns Hopkins University, the University of Delaware, and the New York City Department of Health & Mental Hygiene propose a collaborative two-year research project whose **goal** is to identify critical factors that influence community resilience, incorporate these factors into a predictive conceptual and computer model, and use the model to identify candidate interventions that promote resistance, resilience, and recovery. Our **objectives** are to: (1) Utilize the Johns Hopkins/University of Delaware community-level disaster resilience model and the New York City (pre-Sandy) resilience survey data to identify critical factors that should contribute to a comprehensive predictive model of community resistance, resilience, and recovery, (2) Build/implement the model in a systems dynamics computational environment, and (3) Perturb the model in specifically-crafted ways that test candidate interventions that promote resistance, resilience, and recovery, in order to identify those interventions of greatest efficiency and efficacy for intervention and evaluation. The **outcomes** of this research will be: (1) a NYC-specific conceptual and computer model that predicts post-disaster functioning (including the effects of community resilience), (2) a set of candidate interventions that promote resistance, resilience, and recovery, and (3) a comprehensive evaluation approach for the candidate interventions. The **products** of this research will be: (1) the computer model that NYC can use moving forward, (2) a final report that describes the model and all results, (3) data that can be shared with other researchers and the practice community, and (4) articles for publication.

Ongoing Projects

Collaborative CDI-Type II: Cyber Enabled Discovery System for Advanced Multidisciplinary Study of Humanitarian Logistics for Disaster Response

Principal Investigators: José Holguín-Veras, Rensselaer Polytechnic Institute and Tricia Wachtendorf, University of Delaware
Funding Agency: National Science Foundation

The main goal is to develop a cyber-enabled discovery system, integrating state of the art thinking and methodologies from computer, transportation, mathematical, and social sciences, to: (1) create new paradigms of humanitarian logistic (HL) models that explicitly consider two key aspects not studied by the current techniques: deprivation costs (DC), and material convergence (MC); (2) develop appropriate models to represent human suffering as a DC; (3) develop analytical models to quantify/influence the amount, type, and arrival patterns of donations; (4) gain insight into the links between media framing of needs and MC; (5) define mechanisms to modify donor behavior; and, (6) develop algorithms/heuristics to solve these formulations. This will lead to: models that correctly consider the impacts of logistic decisions on the impacted populations, more effective delivery strategies, more coordinated and effective relief flows, and less congestion at entry points. The importance of the proposed work has been validated by input from participants in HL efforts, and team's direct observations during disaster quick response work to: Haiti-Dominican Republic, New Orleans-Mississippi, Indian Ocean tsunami, 9/11, and others. The team will conduct additional field work to observe disaster relief operations and validate assumptions and models. Far from being solely an exercise of theoretical inquiry, the proposal addresses a problem that is both worthy of high level basic research and that is directly relevant to relief efforts. To enhance project impacts, a vigorous effort will be undertaken to: attract students (especially female and minority) to careers in engineering/social sciences; integrate research and education; and outreach to practitioners.

Collaborative Research Proposal on Improvisation and Sensemaking in Sudden Crisis

Principal Investigators: James Kendra and Tricia Wachtendorf
Senior Personnel: Jasmin Ruback, Ruback & Associates
Graduate Research Assistant: Margaret Nelan, Samantha Penta
Undergraduate Research Assistants: Karly O'Brien, Marrisa Personette, Amy Wolpert
Funding Agencies: 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.

Issues in Disaster Science and Management: A Critical Dialogue between Scientists and Emergency Managers (FEMA)

Principal Investigators: Joseph E. Trainor, Disaster Research Center, and Tony Subbio, Tetra Tech
Graduate Research Assistants: Rochelle Brittingham, Daryl Yoder-Bontrager
Undergraduate Research Assistants: Lindsay Arndt, Courtney Flynn
Funding Agency: FEMA in Higher Education Program

For a long time, the emergency management community has complained about the gap between practitioners and scientists that focus on disasters. This project is designed to develop a textbook that will help bridge this divide. Our approach will focus the attention of academic/practitioner teams' on critical contemporary issues related to disasters. For each issue, academics and practitioners will be selected to describe what we "know." Researchers will be asked to focus on the scientific findings and practitioners will be asked to discuss patterns and variation in national policies/state of practice. The focus of the project will be on facilitating an exchange of ideas between these communities and developing a vision for how their important insights could be brought together to make the US emergency management system better.

Recently Completed Projects

DOT UTC Tier II

Co-Principal Investigators: Sue McNeil, Tricia Wachtendorf
Funding Agency: U.S. Department of Transportation

This six-year multifaceted project ended in December 2013. Over the six years, this project supported several collaborative project involving DRC faculty and students including undergraduates engaged in summer research projects. Specific projects included:

- Resiliency of Transportation Corridors Before, During, and After Catastrophic Natural Hazards (S. McNeil, J. Nigg, and T. DeLiberty)
- Resiliency of Transportation Corridors During Disasters (T. Wachtendorf)
- Infrastructure Security and Emergency Preparedness (S. McNeil, T. Wachtendorf, R. Lee, R. Davidson, and J. Trainor)
- Understanding the Impacts of Climate Change in the I-95 Corridor in Maryland and Delaware (D. Ames and S. McNeil)
- Resiliency of Transportation Corridors during Disaster: An Examination of Cross-Border Networks (T. Wachtendorf)
- Learning from Traffic Data: Evacuation Behavior (S. McNeil)

Interaction between Building and Occupant Responses during Collapse (IBORC)

Principal Investigators: Benigno E. Aguirre and Sherif El-Tawil, University of Michigan
Graduate Research Assistant: Eric Best
Undergraduate Research Assistants: Katrina Gearhart, Brendan Gill
Funding Agency: National Science Foundation

The primary objective of this project is to conduct a multidisciplinary investigation at the intersection of structural engineering, social science, and computer science of how building occupants respond to signals issued by a building during and immediately after a compromising event that threatens its integrity. The project will contribute to the state-of-the-art in hazards research by developing knowledge that could form the basis of public education and awareness programs to help building occupants, their rescuers and city officials respond appropriately during extreme events.

Modeling Natural Disaster Risk Management: A Stakeholder Perspective

Principal Investigator: Rachel Davidson
Co-PIs: Linda Nozick, Cornell University, Jamie Kruse, East Carolina University, and Thomas D. O'Rourke, Jr., Cornell University
Post-doctoral Researcher: Xiaojun Shan
Graduate Research Assistants: Anthony Cario, Jiazhen Peng, Ben Wallace
Undergraduate Research Assistants: Thomas Atadan, Chelsea Barry, Matthew Cory, Dana DiGennaro, Kristen Dukes, Justin Kirk, Eric Linde, Monika Marciszewski, Karly O'Brien, Marguerite O'Leary, Kelley Philbin, Peter Rebuck, Luke Schneider, Brinda Shah, Lindsay Shapiro, Ryan Wibbens, Shirin Wilkerson, Emily Winston, Amy Wolpert
Funding Agency: National Institute of Standards and Technology (NIST)

This project worked to (1) develop risk and game theoretic optimization models to support design of a regional natural disaster risk management system that is effective, efficient, sustainable, equitable, and that is appealing to each of the key stakeholders to make it implementable; and (2) demonstrate application of the models in case studies. The modeling is novel in: (1) using sophisticated large-scale game theory optimization to model regional natural disaster risk management; (2) incorporating a realistic representation of regional risk and mitigation options; (3) explicitly considering the differing objectives, constraints, and alternatives of each of the key stakeholders (e.g., building owners, insurers, government); (4) recognizing the biases people and organizations have in making disaster risk decisions; (5) allowing decisions and investments to be made over time; and (6) representing the large uncertainty in disaster losses. The case study analyses focused on wood frame residential buildings in North Carolina (subject to hurricane risk) and Los Angeles (subject to earthquake risk). Successful completion of the project will provide tools to help address the increasingly severe problem of natural disaster risk, a topic of major national concern, within the purview of the ARRA, and of direct interest to NIST.

Modeling Post-earthquake Fire Spread

Principal Investigator: Rachel Davidson
Funding Agency: Multidisciplinary Center for Earthquake Engineering Research (MCEER)

This project focused on the ignition and spread of fires after earthquakes.

RAPID: Post-earthquake Fires in the March 2011 Japan Earthquake and Tsunami

Principal Investigator: Rachel Davidson
Funding Agency: National Science Foundation RAPID Program

The Tōhoku earthquake caused 345 fires—more recorded fires than any other earthquake in history. By comparison, there were about 110 recorded in Kobe (1995), 110 in Northridge (1994), 128 in San Fernando (1971), and 36 in Loma Prieta (1989). This RAPID project studied the fire-related aspects of the March 2011 Japan earthquake with the aims to improve understanding of where, when, and how fires ignite; how fires spread through a neighborhood; and how they ignite and are suppressed in industrial facilities. The project involved three main steps: (1) collecting data on the fire-related aspects of the event through site visits, interviews with key informants, and secondary data sources; (2) compiling the data into easily usable, comprehensive databases that includes all data on each fire and relevant auxiliary data in a consistent format; and (3) analyzing the data through descriptive statistics, fitting generalized linear statistical models to the ignition data, and

comparing observations of spread to that estimated by a new physics-based urban fire spread model. The PI and consultant on the project have extensive background in the study of post-earthquake fires, including field investigation of past events and development of models of ignitions, spread, and suppression.

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

Principal Investigator: Joseph Trainor
Graduate Research Assistants: Danielle Nagele, Anthony Cario
Undergraduate Research Assistants: Thomas Atadan, Chelsea Barry, Matthew Cory, Kristen Dukes, Justin Kirk, Shayne Larkin, Eric Linde, Monica Marciszewski, Precious Morris, Kelly Philbin, Peter Rebuck, Luke Schneider, Abigail Scout, Brinda Shah, Lindsay Shapiro, Peter Shaw, Ryan Wibbens, Shirin Wilkerson
Funding Agencies: National Science Foundation (NSF) Engineering Research Center for the Collaborative Adaptive Sensing of the Atmosphere (ERC-CASA)

This project focused on three overlapping area of concern. First, we analyzed the data developed in previous years. Second, we completed the implementation of a baseline survey in the Dallas-Fort Worth test bed area to gauge public perception of severe weather and severe weather warnings. Finally, we supported ongoing efforts to expand partnerships with potential funding agencies and governmental offices that may find the CASA system and our approach of value.

Workshop on Deploying Post-disaster Quick-response Reconnaissance Teams: Methods, Strategies, and Needs

Principal Investigator: James Kendra
Graduate Research Assistant: Sarah Gregory
Funding Agency: National Science Foundation

The purpose of the workshop was to assess the state-of-the-art on quick response research and to provide recommendations to NSF on the administration of the RAPID grant program—a principal source of funding for quick response reconnaissance deployments. This workshop brought together experts in this particular research genre to share methods and best practices in order to improve the science and art of quick response research, and to bolster methods for conducting quick-response post-disaster reconnaissance studies.

DRC Field Studies

In addition to our regular projects, researchers at DRC have conducted over 695 field studies since the Center's inception, traveling to communities throughout the United States and internationally in the immediate aftermath of disasters. Our work has encompassed a broad range of disaster types. Recent field studies have focused on a number of topics including organization, multi-organizational coordination, behavioral response to disasters, warning and evacuation, and vulnerability.

This section offers a brief list of the field research conducted by DRC faculty and graduate students during the past calendar year.

Location: Moore, Oklahoma and Oklahoma City, Oklahoma
Date: May 24–28, 2013
Researchers: Lauren Clay and Alex Greer
Funding Agency: Disaster Research Center
Project Title: Oklahoma Tornadoes, 2013 Quick Response Reconnaissance Trip
Purpose: This quick response research trip following the May 20th tornado focused primarily on the mental health response effort. It also covered other areas of interest, such as looting concerns, material convergence, and volunteer coordination.

Locations: Moore, Oklahoma, Oklahoma City, Oklahoma, and Shawnee, Oklahoma
Dates: May 26–June 2, 2013
Researchers: Samantha Penta and Margaret Nelan
Funding Agency: National Science Foundation
Project Title: Collaborative CDI-Type II: Cyber Enabled Discovery System for Advanced Multidisciplinary Study of Humanitarian Logistics for Disaster Response
Purpose: Researchers deployed during this quick response field study looked at material convergence and motivations behind donations drives during the aftermath of the May 19th and 20th tornadoes.

Locations: Moore, Oklahoma, Oklahoma City, Oklahoma, and New Castle, Oklahoma
Dates: May 27–31, 2013
Researchers: Danielle Nagele and Lucia Velotti
Funding Agency: National Science Foundation
Project Title: Collaborative Adaptive Sensing of the Atmosphere (CASA)
Purpose: This field research studied public decision making during tornado warnings, including their perception and understanding of weather alerts in the Moore, Oklahoma City, and New Castle areas during the May 20th tornado. Researchers also observed the evacuation at the Will Rogers Airport first hand when the May 31st tornado struck the area.

An example of the physical devastation resulting from the EF5 tornado that struck Moore, Oklahoma.
(Photo by DRC Staff)

A temporary corporate service tent providing community resources following the May 20, Moore, Oklahoma, tornado.
(Photo by DRC Staff)

A destroyed house on the outskirts of Tacloban on Leyte island. This region was the worst affected by the typhoon, causing widespread damage and loss of life. Caritas is responding by distributing food, shelter, hygiene kits and cooking utensils.
(Photo by U.S. Navy Mass Communication Specialist Seaman Liam Kennedy/ RELEASED)

A Guiuan, Eastern Samar Province, woman stands outside of her makeshift shack in the aftermath of Super Typhoon Haiyan.
(Photo by Eoghan Rice - Trócaire / Caritas)

Education/Mentoring

Students, staff, and faculty affiliated with DRC all play an important role in graduate and undergraduate education at the University. Faculty offer related classes, advise students (as academic advisors and advisors for independent studies and research), and serve on comprehensive exam and dissertation committees; faculty and staff offer professional training sessions for graduate and undergraduate students; and graduate students mentor undergraduates and serve as teaching assistants. The Disaster Research Center has a history of engaging graduate and undergraduate students in research. Although DRC does not admit students, offer classes, or award degrees, faculty teach classes as part of their responsibilities in their home departments, serve in the governance of academic programs, and also provide instruction through the interdisciplinary M.S. and Ph.D. program in Disaster Science and Management.

This section highlights DRC's vision of education and mentoring.

Doctoral Dissertations

Eric Best

"Incorporating Groups, Collective Behavior, and Information Visualization in Agent-based Models of Evacuation." School of Public Policy and Administration and Disaster Research Center, University of Delaware, Newark, Delaware.

Jennifer Marie Santos Hernández

"Integrating Perspectives on Social Vulnerability to Disasters and Emergency management in Puerto Rico." Department of Sociology and Criminal Justice and Disaster Research Center, University of Delaware, Newark, Delaware.

Yvonne Rademacher

"The Political Economy of Community Disaster Management Assets: A Case Study of the Farm Community in Sussex County, Delaware." School of Public Policy and Administration and Disaster Research Center, University of Delaware, Newark, Delaware.

Master's Theses

Jennifer D. Lazo

"Framing Disaster Planning for People with Disabilities: Analyzing the Calif. V. City of Los Angeles Lawsuit." School of Public Policy and Administration and Disaster Research Center, University of Delaware, Newark, Delaware.

Samantha Penta

"The Value of Preparedness: Organizational Culture and Preparedness in Delaware Nursing Homes." Department of Sociology and Criminal Justice and Disaster Research Center, University of Delaware, Newark, Delaware.

Eva K. Wilson

"Lessons Learned the Hard Way: Incident Command System Learning and Training." School of Public Policy and Administration and Disaster Research Center, University of Delaware, Newark, Delaware.

DRC Sponsored Seminars

"Quick Response Workshop." Sponsored by IAEM@UD (the University of Delaware's student chapter of the International Association of Emergency Managers) and the Disaster Research Center, University of Delaware, November 8. Participants included Melissa Archer, Rochelle Brittingham, Ryan Burke, Ava Carcirieri, Anthony Cario, Lauren Clay, Zephi Francis, Brian Gildemeyer, Jim Goetschius, Alex Greer, Sarah Gregory, Elliot Hale, Kyle Herring, Israt Jahan, Mei Johnson, Luye Li, Hans Louis-Charles, Danielle Nagele, Sam Penta, Marissa Personette, Lindsay Shapiro, Ben Wallace, Victor Wang, and Daryl Yoder-Bontrager

"Understanding the Vulnerability to Natural Catastrophes in Azores and Madeira Archipelagos (Portugal). Disasters, People, Memory and Resilience." Presented by visiting scholar Nuno Martins, University of Azores.

Graduate Student Achievements

DRC graduate students are typically among the more outstanding graduate students at the University of Delaware and frequently excel within their major discipline. The following graduate students were recognized by the University for their academic achievements with the awards cited or participated in the noted disaster related extra-curricular activities.

Danielle Nagele was selected to participate in the 2013 American Meteorological Society Summer Policy Colloquium.

Samantha Penta, Lee Zelewicz, Chunjing Liu, Ben Wallace, Alex Greer, Maggie Nelan and **Ashley Farmer** all participated in the University of Delaware's 7th Annual Sociology and Criminal Justice Graduate Student Conference.

Ben Wallace interviewed Illan Kelman of the Center for International Climate and Environmental Research in Oslo, Norway on the University of Delaware's radio station, WVUD, as part of the "Beyond Rhetoric" program. The focus was on reducing disaster vulnerability.

Outreach/Dissemination

DRC is well known in the academic community of disaster researchers for the development of research methods and theory within the field. This section illustrates our activities aimed at applying or distributing the information and knowledge gained from DRC research projects and institutional history.

Peer Reviewed Publications

The following are publications authored or co-authored by DRC faculty, students and staff that are related to disasters and which have undergone the peer review process. The list is divided according to publication type.

Articles

Simon A. Andrew, Sudha Arlikatti, Laurie C. Long, and James Kendra

2013. "The Effect of Housing Assistance Arrangements on Household Recovery: An empirical Test of Donor-assisted and Owner-driven Approaches." *Journal of Housing and Built Environment*, 28(1): 17–34.

Rochelle Brittingham and Tricia Wachtendorf

2013. "The Effect of Situated Access on People with Disabilities: An Examination of Sheltering and Temporary Housing after the 2011 Japan Earthquake and Tsunami." *Earthquake Spectra*, 29(S1): S433-S455.

Yeliang Han, Rachel A. Davidson, Greg Black, and Shiling Pei

2013. "A Regional Perspective on Defining Seismic Performance Objectives for Woodframe Buildings." *Structural Safety*, 43: 50–59.

Ziqiang Han and Ruiping Xin

2013. "Let's Move Out: An Alternate Way to Recovery." *IAEM Bulletin*, 30(4): 19.

José Holguín-Veras, Miguel Jaller, and Tricia Wachtendorf

2013. "Improving Postdisaster Humanitarian Logistics: Three Key Lessons from Catastrophic Events." *TR News*, 287: 4–10.

H. Lawrence Hotchkiss, B. E. Aguirre, and Eric Best

2013. "A Critique of the Official Report on the Evacuation of the World Trade Center: Continued Doubts." *Disasters*, 37(4): 695–704.

Michael K. Lindell, Dan S. Sutter, and Joseph E. Trainor

2013. "Individual and Household Response to Tornadoes." *International Journal of Mass Emergencies and Disasters*, 31(3): 373–383.

David A. McEntire, Joshua Kelly, James M. Kendra, and Laurie C. Long

2013. "Spontaneous Planning after the San Bruno Gas Pipeline Explosion: A Case Study of Anticipation and Improvisation during Response and Recovery Operations." *Journal of Homeland Security and Emergency Management*, 10(1): 1–25.

Mary Nelan and Sara E. Grineski

2013. "Responding to Haiti's Earthquake: International Volunteers' Health Behaviors and Community Relationships." *International Journal of Mass Emergencies and Disasters*, 31(2): 293–314.

Yvonne Rademacher

2013. "Community Disaster Management Assets: A Case Study of the Farm Community in Sussex County, Delaware." *International Journal of Disaster Risk Science*, 4(1): 33–47.

Dana Rathfon, Rachel Davidson, John Bevington, Alessandro Vicini, and Arleen Hill

2013. "Quantitative Assessment of Post-disaster Housing Recovery: A Case Study of Punta Gorda, Florida, after Hurricane Charley." *Disasters*, 37(2): 333–355.

Joseph E. Trainor and Lucia Velotti

2013. "Leadership in Crises, Disasters, and Catastrophes." *Journal of Leadership Studies*, 7(3): 38–40.

María del Valle Barrera, Tomás Koch, and Benigno E. Aguirre

2013. "Commemorating Chile's Coup: The Dynamics of Collective Behavior." *Latin American Politics and Society*, 55(2): 106–132.

Lucia Velotti, Joseph E. Trainor, Karen Engel, Manuel Torres, and Takumi Myamoto

2013. "Beyond Vertical Evacuation: Research Considerations for a Comprehensive 'Vertical Protection Strategy'." *International Journal of Mass Emergencies and Disasters*, 31(1): 60–77.

Tricia Wachtendorf, Bethany Brown, and Jose Holguin-Veras

2013. "Catastrophe Characteristics and Their Impact on Critical Supply Chains: Problematizing Materiel Convergence and Management Following Hurricane Katrina." *Homeland Security and Emergency Management*, 10(2): 1–24.

Book Chapters

José Holguín-Veras, Tricia Wachtendorf, Miguel Jaller, and Theresa Jefferson

2013. "Logistics and the Management of Critical Supplies Following Catastrophes." *Preparedness and Response for Catastrophic Disasters* edited by Rick Bissell. Boca Raton, FL: CRC Press.

Tricia Wachtendorf

2013. "Emergent Organizations and Networks in Catastrophic Environments." *Preparedness and Response for Catastrophic Disasters* edited by Rick Bissell. Boca Raton, FL: CRC Press.

Tricia Wachtendorf, Mary M. Nelan, and Lynn Blinn-Pike

2013. "Households and Families." *Social Vulnerability to Disasters*, Second Edition, edited by Deborah S. K. Thomas, Brenda D. Phillips, William E. Lovekamp, and Alice Fothergill. Boca Raton, FL: CRC Press.

Presentations at Professional Conferences

DRC personnel regularly participate in conferences and professional meetings that contribute to the field. Below are lists of these activities.

Paper Presentations

Eric Best

"Practicing What We Publish: The Gap Between Building Evacuation Research and Building Evacuation Modeling." Presented at the annual IRCD meeting, July 17, 2013, Broomfield, Colorado.

Invited Presentations

Rachel Davidson

"Modeling Natural Disaster Risk Management: Integrating the Roles of Insurance and Retrofit and Multiple Stakeholder Perspectives." Presented to the Department of Civil and Natural Resources Engineering at the University of Canterbury, September 20, 2013, Christchurch, New Zealand.

"Optimal Seismic Mitigation Program Design for Infrastructure System Networks." Presented as part of the New Zealand National Lifelines Week, December 2–6, 2013, Christchurch, New Zealand.

James Kendra

"The Human Factor in Environmental Disasters." Panel presentation at the 13th National Conference on Science, Policy, and the Environment, January 16, 2013, Washington, D.C.

"Regional Challenges to Building Resilience." Presented at the 4th Conference on Community Resilience, August 28-30, 2013, Davos, Switzerland.

"Environmental Crisis and the Transformation of Environmental Norms." Presented at the 4th Conference on Community Resilience, August 28–30, 2013, Davos, Switzerland.

Tricia Wachtendorf

"Moving On: The Challenge of Recovery in Catastrophic and Chronic Technical Disasters." Keynote presented at the Workshop on the Fukushima Prefecture Recovery, May 26, 2013, Nihonmatsu City, Japan.

"Chronic Technical Disasters and Perspectives on Recovery for Fukushima Prefecture." Presented at Strengthening the Lives and Sustaining the Culture of the People of Tohoku: Tokyo International Symposium, August 31, 2013, Tokyo Kasei University, Tokyo, Japan.

Pat Young

"What about Collections? Mitigation Best Practices for University Collections to Ensure Resilience." Presented at the Disaster Resistant University Workshop, University of New Orleans, March 1, 2013, New Orleans, Louisiana.

Poster Presentations

Lauren Clay, Kimberly Gill, Alex Greer, and James Kendra

"Disaster Mental Health Response: Lessons Learned From a Case Study of the 1974 Xenia Tornadoes." Presented at the 38th Annual Natural Hazards Research and Applications Workshop, July 13–16, 2013, Broomfield, Colorado.

Chunjing Liu

"The Review of Resilience Research and Practice in Disaster Management." Presented at the 38th Annual Natural Hazards Research and Applications Workshop, July 13–16, 2013, Broomfield, Colorado.

Conferences Attended

13th National Conference on Science, Policy, and the Environment, January, 2013, Washington, D.C. Attended by **James Kendra** and **Margaret Nelan**.

38th Annual Natural Hazards Research and Applications Workshop, July 13–16, 2013, Broomfield, Colorado. Attended by **Eric Best, Lauren Clay, Alex Greer, Danielle Nagele, Maggie Nelan, Sam Penta, James Kendra, Joseph Trainor, Tricia Wachtendorf.**

Temporary medical facilities serving the people of Moore, Oklahoma, following the May tornado.

(Photo by DRC Staff)

DRC graduate research assistants Lucia Velotti (left) and Danielle Nagele (right) in the field following the Moore, Oklahoma, tornado.

(Photo by DRC Staff)

DRC graduate research assistants Maggie Nelan (top photo) and Sam Penta (bottom photo) make observations and collect data from the field following the Oklahoma tornado.

(Photos by DRC Staff)

DRC in the News

DRC events and activities were publicized regularly throughout the calendar year by the University's electronic newsletter, *UDaily* as well as other University of Delaware publications. The following are the news stories for 2013 along with their Web URLs:

"Black Doctoral Network Conference: UD Has Strong Presence at Inaugural Black Doctoral Network Conference"

> Among those attending this conference that emphasized the importance of networking for African American students was DRC graduate student Hans Louis-Charles, a PhD candidate in UD's Disaster Science and Management Program.
>
> Available online at http://www.udel.edu/udaily/2014/oct/doctoral-network-101413.html

"Dramatic Connection: Local Production of '12 Angry Jurors' Boasts UD Connections"

> DRC's very own director, Dr. James Kendra, was among the cast members in Newark's Chapel Street Players performances of this play based on the renowned 1950s teleplay. This article notes the various UD connections within the cast.
>
> Available online at http://www.udel.edu/udaily/2013/apr/connections041213.html

"Hurricane Research: Team Studies New Methods to Support Hurricane Evacuation Decision-making"

> DRC Associate Director Dr. Tricia Wachtendorf and DRC Core Faculty member Dr. Rachel Davidson are bringing the disciplines of sociology and civil engineering together to collaborate on a project that will develop a model to support evacuation decisions. This article describes some of the details of the project.
>
> Available online at http://www.udel.edu/udaily/2014/sep/hurricane-evacuation-091213.html

"Innovative Collaborative Programs"

> The increasingly complex scientific, technical and social challenges in our world often necessitate a convening of expertise across multiple fields. To prepare the specialized academicians and professionals who will address those challenges, the University of Delaware offers many interdisciplinary graduate programs that cross department and college boundaries. As this article points out, the Disaster Science and Management Program is among them.
>
> Available online at http://www.udel.edu/gradoffice/newsletter/spring2013/programs.html

"Learning from Disaster: UD Graduate Students Deployed to Oklahoma in Aftermath of Tornadoes"

> This article features DRC graduate students Lauren Clay, Alex Greer, Danielle Nagele, Maggie Nelan, Sam Penta, and Lucia Velotte, and reflects on the scholarly value of their field research experience in Moore, Oklahoma.
>
> Available online at http://www.udel.edu/udaily/2013/jun/disaster-research-062613.html

"Survivors Share Their Stories in Tornado's Wake"

As with the previous article, this piece also discusses the field research of these six DRC graduate students as they met with survivors of the Moore, Oklahoma, tornado.

Available online at http://www.udel.edu/udmessenger/vol21no4/pdfs/vol21no4-noninteractive.pdf

"Writing Helps Students Get Past the Trauma of Disaster"

DRC Affiliate Faculty member Dr. Deborah Alvarez is highlighted in this article that discusses the benefits to adolescents of writing about their experiences in the wake of disaster events. She notes that writing can often help those youngsters cope with the frequent trauma caused by such experiences.

Available online at http://www.udel.edu/researchmagazine/issue/vol4_no2/disaster.html

In addition to regular inclusion in *UDaily,* DRC staff members were also contacted for expert opinions that appeared in outside public media sources. The following are examples of these DRC appearances.

"After Sandy, Resilience for Some Means Rebuilding Somewhere Else." *Aljazeera America*.

In this article carried by the prominent online news channel, DRC Director Dr. James Kendra discusses the concept of resilience as it relates to the recovery of communities impacted by Hurricane Sandy. The full story is available online at http://america.aljazeera.com/articles/2013/10/29/after-sandy-resiliencyforsomemeansrebuildingsomewhereelse.html

"As FEMA Heads to Oklahoma, Agency Worries about Finances." *All Things Considered*.

This National Public Radio news story featured a discussion between NPR reporter Brian Naylor and FEMA Director Craig Fugate and also included comments from DRC Director Dr. James Kendra. A transcript and recording of the story are available online at http://whyy.org/cms/radiotimes/2013/04/16/reaction-to-the-boston-bombings/

"In Wake of Hurricane Sandy, Oklahoma Tornadoes, NSF Awards $32 Million in Hazards Sustainability Grants." *National Science Foundation* website.

Among those receiving grants through the National Science Foundation's Science, Engineering and Education for Sustainability (NSF SEES) program was DRC Core Faculty member Dr. Rachel Davidson. Her project title is "Dynamic Integration of Natural, Human, and Infrastructure Systems for Hurricane Evacuation and Sheltering." Also funded through the NSF SEES program was "Next Generation, Resilient Warning Systems for Tornadoes and Flash Floods" on which DRC Core Faculty member Dr. Joseph Trainor is a collaborator. The article detailing the NSF Hazards SEES program is available online at http://www.nsf.gov/news/news_summ.jsp?cntn_id=129307

"Money Limitations Lead Many to Rebuild in Place after Sandy." *The [Wilmington] News Journal*.

This article considers the recovery of communities impacted by Hurricane Sandy. Included are notes regarding related research conducted at DRC under the leadership of DRC Director Dr. James Kendra.

"Oklahoma Tornado PTSD: How Survivors Are Coping." *Huffington Post*.

DRC Core Faculty member Dr. Joseph Trainor, was quoted in this story discussing the potential psychological impact of the tornado that devastated Moore, Oklahoma. The story can be found online at http://www.huffingtonpost.com/2013/05/21/oklahoma-tornado-ptsd_n_3314640.html

"'The Old FEMA is Gone': Craig Fugate's Cleaned-up FEMA." *NBC News*.

NBC News staff writer Elizabeth Chuck explores the changes made to FEMA under Director Craig Fugate's management. DRC Associate Director Dr. Tricia Wachtendorf weighs in on the transformation in this news story. The complete story is available online at http://www.nbcnews.com/news/other/old-fema-gone-craig-fugates-cleaned-fema-f4B11229783

"Reaction to the Boston Bombings." *Radio Times with Marty Moss-Coane*.

The featured guests on this special segment on National Public Radio's syndicated program included DRC Associate Director Dr. Tricia Wachtendorf. A recording of the program is available online at http://whyy.org/cms/radiotimes/2013/04/16/reaction-to-the-boston-bombings/

"A Year After Sandy, Research Focuses on the Social Impact of Disasters: Researchers Say Projects Combine Different Disciplines and Seek to Improve Communication." *U.S. News & World Report*.

This article reviews two different research efforts conducted in the wake of Hurricane Sandy by the University of Pittsburg's Dr. Louise Comfort as well as DRC Associate Director Dr. Tricia Wachtendorf. The complete story is available online at http://www.usnews.com/news/articles/2013/10/30/a-year-after-sandy-research-focuses-on-the-social-impact-of-disasters

Structural damage caused by the Oklahoma tornado.

(Photo by DRC Staff)

Reconstruction materials are held in a school gym following the Moore, Oklahoma, tornado. Inset: DRC graduate research assistants (l-r) Sam Penta, Mei Johnson, and Anthony Cario in front of the Emergency Operations Center in Moore, Oklahoma.

(Photo by DRC Staff)

Visitors to DRC

DRC hosts numerous national and international visitors throughout the year, many of whom come to work with DRC personnel and to utilize the E. L. Quarantelli Resource Collection. In addition, DRC also sponsors a speaker series intended to initiate novel and provocative discussion of disaster related topics.

The following is a list of the visitors to DRC during the past year along with their institutional affiliation.

January

Everett M. Ressler, Senior Technical Advisor and Researcher, KonTerra Group, Washington, DC, USA

Cècile Stehrenberger, University of Zurich, Zurich, Switzerland

Veronica Strandberg, Department of Political Science and Research Center for Disaster Medicine of Umeå University, Umeå, Sweden

February

Sara Bondesson, Crisis Management Research and Training (CRiSMART), Stockholm, Sweden

Helena Hermansson, Crisis Management Research and Training (CRiSMART), Stockholm, Sweden

Frederico Ferreira Pedroso, World Bank, Brazil

Joseph Scanlon, Carleton University, Ottawa, Ontario, Canada

Eric Stern, University of Virginia, Charlottesville, Virginia, USA

J. David Weidner, Health Care Association of New Jersey, Hamilton, New Jersey, USA

May

Eleonora Gioia, Università Politecnica delle Marche, Ancona, Italy

September

David M. Abramson, National Center for Disaster Preparedness, The Earth Institute, Columbia University, New York, New York, USA

Glenn Kashurba, National Disaster Medical System, Washington, D.C., USA

Joseph Scanlon, Carleton University, Ottawa, Ontario, Canada

October

Laila Alfirdaus, Gadjah Mada University, Bulaksumur, Yogyakarta, Indonesia

November

Beatrice Gatto, Polytechnic University of Marche, Ancona, Italy

Craig Parsons, Yokohama National University, Yokohama, Japan

Other Disaster-Related Activities

In addition to the activities listed above, DRC faculty, students and staff also participate in a range of activities pertaining to disasters including affiliations with various Boards, serving as reviewers for disaster related journals, etc.

Below is a brief list of affiliations currently held by DRC personnel.

Pat Young

- Attended "Preservation Matters!: Disaster Stories of Response and Recovery," April 24, 2013, Ripley Center, Smithsonian Institution, Washington, DC
- Chair, Emergency Response Working Group (ERWG), University of Delaware
- Chair, Delaware Disaster Assistance Team (DDAT)

The E. L. Quarantelli Resource Collection

Pat Young, Resource Collection Coordinator, is seated in the collection space of the E. L. Quarantelli Resource Collection.

(photo by Erna Danielsson, DRC visiting researcher from Mid Sweden University)

Report of Activities

During 2013 the E. L. Quarantelli Resource Collection continued to serve a vital role within the broader activities of DRC. The following notes provide a glimpse of some of the highlights both in terms of collection growth and related activity.

Collection Growth, Development, and Access

Over the course of 2013, 1,187 new items were added to the Resource Collection. This was an increase of 159 additional items over the previous year's new acquisitions. New materials were acquired through selective purchasing, internal and external donations, systematic compilation of open access Web resources, and the Surplus Books Program at the Library of Congress which continues to offer some of the more unique, obscure and unusual items to be selected. As a result of this recent growth, the collection now numbers approximately 61,000 items – one of the largest collections of material on disasters in the world. The scope and content of the collection continues to draw interested researchers from around the globe,

most recently from Brazil, Canada, Indonesia, Italy, Japan, Sweden and Switzerland, as well as numerous scholars and practitioners from across the United States.

In addition to the many international scholars supported by the collections content, students at the University of Delaware also continue to benefit from access to the E. L. Quarantelli Resource Collection. Along with graduate students enrolled in the University's Disaster Science and Management programs, students from a unique cross-section of other disciplines find the collection's materials useful. These include such areas as Engineering, Fashion and Apparel Design, Political Science, Public Policy and Administration, and Business Administration, to name a few.

Among the most important projects within the collections that was completed this past year was the digital preservation of the audio recordings comprising the Disaster Research Oral History Project. This project which was conducted by Henry Quarantelli and captured the thoughts and reflections of such prominent members of the disaster research field as Kitao Abe, Fred Bates, James Brown, Wolf Dombrowsky, Charles Fritz, James Kerr, Lewis Killian, Jiri Nehnevajsa, Roy Popkin, Rich Rotanz, Harry Williams, Russ Dynes, and Quarantelli himself, yielded 32 audio cassettes containing many hours of recorded interviews. The goal was to create digital recordings from the original audio tapes and in the process, improve the sound quality of those recordings. As a result, this truly priceless collection has been preserved for future generations of disaster researchers who will be able to look back at the early days of the field through the eyes of those who lived the experience.

Activities of the Resource Collection Staff

Resource Collection Coordinator Pat Young continued to serve as Chair of both the Delaware Disaster Assistance Team (DDAT) and UD's Emergency Response Working Group (ERWG) throughout 2013. Both DDAT and ERWG address the broad spectrum of emergency- and disaster-related topics that pertain to collections. Through her involvement with these two groups she was able to enhance care and preparedness activities of the Resource Collection. One of the best examples of this was her participation in the DDAT sponsored Community Emergency Response Team (CERT) training – a two day, intensive training program covering a broad spectrum of emergency preparedness topics, skills, and needs. Pat is now a certified CERT member and she's equipped and prepared to face whatever disaster situation might befall the E. L. Quarantelli Resource Collection or the University community at large.

In addition to active participation in both DDAT and ERWG, Pat accepted a volunteer position on the Advisory Committee for Heritage Preservation's State Heritage Emergency Partnership (SHEP) Project. This national initiative strives to establish statewide or regional preparedness and response networks that create partnerships between cultural heritage organizations (museums, libraries, archives and historical societies) and statewide emergency managers and first responders. The Advisory Committee is providing ongoing input regarding how best to accomplish this sometimes daunting and always challenging task.

Going forward, the primary focus of the staff overseeing the E. L. Quarantelli Resource Collection will be to continue working diligently to identify new and innovative ways to collect, capture, preserve and provide access to the vital information that has become so integral to the disaster research field and process.

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UNIVERSITY OF DELAWARE

111 Graham Hall, Room 166
Newark, DE 19716-7399
Phone: 302-831-6618
Fax: 302-831-2091