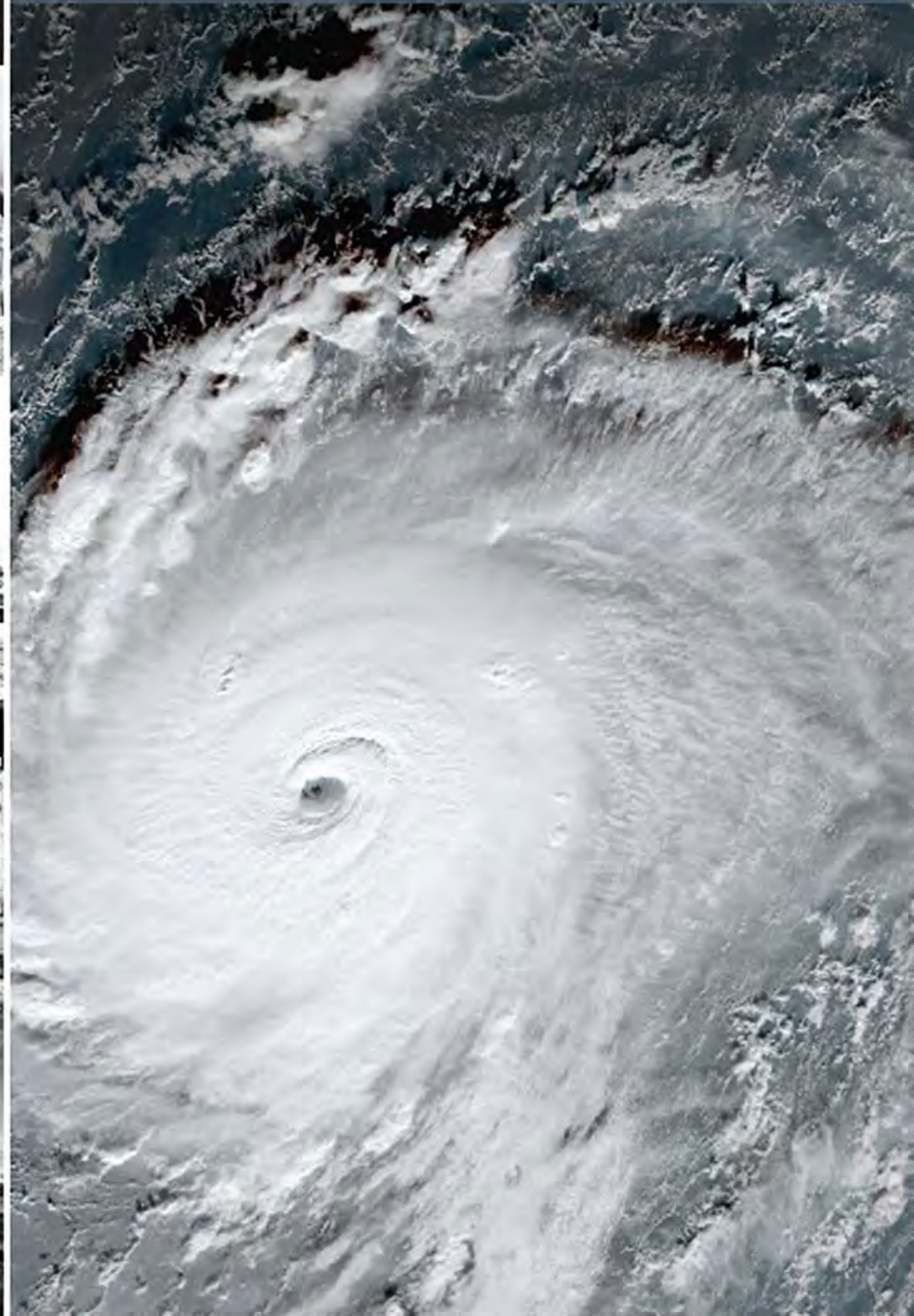


**NATURAL  
HAZARDS  
CENTER**



# Research Counts



# Index

## Introduction to the *Research Counts* Series

### Research Counts

By Lori Peek ..... 5

## *Research Counts* Articles – 2017-2018

### Part I: Why is Houston So Vulnerable to Flooding?

By Philip Berke ..... 6

### Part II: How Houston Can Learn to Build Back Better from Other Cities

By Philip Berke ..... 8

### Who Lives Here? How Understanding Culture Reduces Suffering, Speeds Recovery, and Supports Resilience

By Katherine Browne ..... 10

### A World of Disasters: Knowing More and Losing More

By Ian Burton ..... 12

### Helping Those Most in Need First: Leveraging Social Vulnerability Research for Equitable Disaster Recovery

By Susan Cutter and Christopher Emrich ..... 14

### Infant Feeding in Emergencies: How to Support Families During Evacuation and Sheltering

By Sarah DeYoung ..... 16

### An Ongoing Disaster: Hurricane Maria's Potential Effects on Public Health

By Alexa Dietrich, Adriana Garriga-López, and Aman Luthra ..... 18

### Some Lessons from Katrina

By Kai Erikson ..... 20

### Supporting Children in All the Spheres of Their Lives: Lessons from Katrina

By Alice Fothergill and Lori Peek ..... 22

### Who Will Protect Recovery Workers after Hurricane Harvey?

By Elizabeth Fussell ..... 24

### Preparing the Whole Community: Including Homelessness in Disaster Planning

By June Gin ..... 26

### People Matter: The Social Element of Disaster Response and Recovery

By Stefanie Haeffele and Virgil Henry Storr ..... 28

### Intricate and Uneven: Housing Recovery in Coastal Communities

By Sara Hamideh ..... 30

### Understanding the Unprecedented: Social Vulnerability, Infrastructure Failure, and Catastrophe

By Marccus Hendricks ..... 32

### Vacant Spaces, Missing Faces: Reinvigorating Damaged City Centers

By Nicole Hutton ..... 34

### Reducing Mental Health Barriers to Preparedness: Lessons from Haiti and Nepal

By Leah James and Courtney Welton-Mitchell ..... 36

### Miss Katrina is Not Finished with Me: Acknowledging the Explanatory Overreach of Recovery

By Steve Kroll-Smith, Pamela Jenkins, and Vern Baxter ..... 38

### Children, Distress, and Disaster: How Adults Can Help

By Betty Lai and Ann-Margaret Esnard ..... 40

### Smart Recovery: Mapping, Mitigation, and the Long Rebuilding Process

By Michael Lindell ..... 42

### Managerial Perspectives on the Role of Public Libraries in Disaster Response

By Michal Linder ..... 44

### Together We Stand: The Vital Role of Social Networks among Displaced Low-Income Women

By Jacquelyn Litt ..... 46

### Beware of Recovering the Worst Parts: Race, Class, and Gender Guidelines for a Just Recovery

By Rachel Luft ..... 48

### Nonprofit Coordination and Managing Donations: Hidden Keys to Recovery

By Michelle Meyer ..... 50

### It's Time to Bring Back the People: Challenges and Opportunities for Participatory Disaster Recovery

By Samantha Montano and Paolo Cavaliere ..... 52

### Speaking Truth to Power: Please Don't Call Them Natural Disasters

By Richard Olson ..... 54

### America's Deathtrap Schools

By Lori Peek ..... 56

**Value-Added: Analysis of Social Return on Investment for FEMA's Whole Community Approach**

By Liesel Ritchie, Carolyn Kousky, Kathleen Tierney, and Simone Domingue..... 58

**Cost-Effective Building Regulations Should be Embraced, Not Feared**

By Kevin Simmons..... 60

**What Comes After Hurricane Harvey for People with Disabilities? Restoring, Recovering, and Rebuilding**

By Laura Stough..... 62

**Ending Bias in Disaster Mitigation and Recovery Policies**

By Elaina Sutley ..... 64

**There's Something in the Water...**

By Kathleen Tierney..... 66

**Do I Stay or Do I Go? Hurricane Risk Perception and Evacuation Behavior**

By Craig Trumbo..... 68

**A Place to Call Home: Planning for Equitable Post-Disaster Housing Recovery**

By Shannon Van Zandt..... 70

**Ballistic Missile Threat Inbound: When Human Error is Really (Still) a Systems Error**

By Tricia Wachtendorf and James Kendra ..... 72

**Through the Fog of Disaster: The Process of (Re)Creating Inequities**

By Lynn Weber..... 74

**When Safety is Not Enough: The Impact of Chronic Stressors on Rohingya Refugees in Exile**

By Courtney Welton-Mitchell and Andrew Riley..... 76

**Acknowledgements..... 78**

We hope you will share your feedback on *Research Counts* so we can continue to improve this series. Please follow this link to complete a short survey: [hazards.colorado.edu/rcsurvey](https://hazards.colorado.edu/rcsurvey)

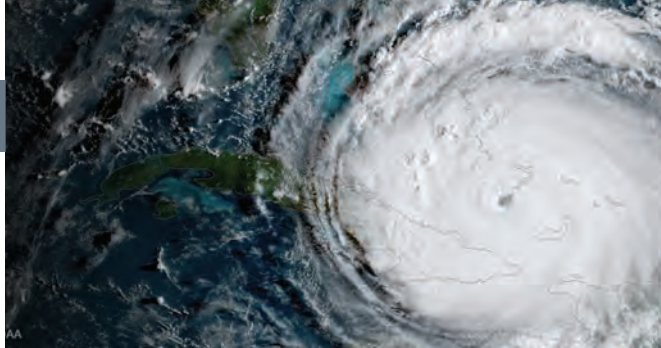


# Research Counts

September 7, 2017

*Unprecedented. Unbelievable. Historic. Catastrophic.*

These are just a few of the words used by the media and others when attempting to describe recent disasters that in many ways seem beyond description. Hurricane Harvey dumped more than four feet of rain in southeast Texas and southwest Louisiana. All summer, wildfires have raged across Europe, Canada, and the United States. Tens of millions have been directly affected by massive flooding in India, Bangladesh, and Nepal. Hurricane Irma, still churning over warm waters as of this writing, has already flattened most of Barbuda and has wreaked havoc across several other Caribbean islands.



*The eye of Hurricane Irma passing the eastern end of Cuba at about 8:00 am (eastern) on September 8, 2017, as captured by the NOAA GOES-16 infrared satellite. Source: NOAA/NASA GOES Project, 2017.*

These and the numerous other events unfolding across the globe have claimed lives, destroyed infrastructure, and will leave entire regions uninhabitable for long stretches of time. It is true that, according to many measures, these extreme events are record-breaking. But in other ways, they are not without precedent.

Hazards and disaster researchers have consistently and systematically studied the causes and consequences of such events for more than seven decades. This research community has amassed an enormous amount of knowledge regarding everything from the root causes of disaster to the long-term ramifications of unjust recovery policies.

Make no mistake, with each fresh catastrophe comes new questions; new opportunities for learning. But there are also important commonalities that have been documented time and again across disasters.

The research that is already available matters and we must make it count. In this era of the mega-disaster, the stakes are too high for these empirical insights to sit on a shelf. The decisions that are being made are too important for evidence-based findings to be sidelined in the process. Facts matter. Research counts.

The Natural Hazards Center is committed to uplifting the work of others and to bringing it to new audiences. To that end, we are launching a new initiative called *Research Counts*. This series will serve as a platform for hazards and disaster scholars to provide insights regarding major research findings and enduring lessons. It will also provide a forum for raising new questions worthy of exploration. The pieces in the series are brief and intended for broad consumption. We want to work with our community to get this knowledge into the hands of those who need it most.

We are launching the series with original briefs from experts in a variety of disciplines, ranging from anthropology to engineering. These scholars are lending their voices to help us understand the catastrophes that are disrupting lives and livelihoods the world over, and to place them in broader context. To read the contributions, please visit: <https://hazards.colorado.edu/news/research-counts>.

Our community of hazards and disaster researchers has long shown a deep and abiding commitment to working with practitioners, policy makers, and the private sector to help reduce hazards risk and to ameliorate the terrible suffering caused when disaster strikes. If you are interested in contributing to this new series, please contact me directly: [Lori.Peek@Colorado.edu](mailto:Lori.Peek@Colorado.edu). We want to hear from you and to share your knowledge and ideas. As all of humanity confronts the reality of climate change, it is all the more critical that our research community respond in kind by sharing the lessons learned from prior and ongoing work to a larger audience. Thank you for all that you do.

Please take care of yourself and others.

Lori Peek, Director  
Natural Hazards Center

## About the Author



*Lori Peek is director of the Natural Hazards Center and professor in the Department of Sociology at the University of Colorado-Boulder. She studies vulnerable populations in disaster and is author of Behind the Backlash: Muslim Americans after 9/11, co-editor of Displaced: Life in the Katrina Diaspora, and co-author of Children of Katrina.*



## Part I: Why is Houston So Vulnerable to Flooding?

A Houston suburb as seen from the air. Houston's fast-growing development has led to greater flood risk. ©Wayne S. Grazio, 2015.

September 13, 2017

By Philip Berke

*This is a revised and expanded version of an earlier piece published by the BBC.*

Houston and surrounding regions were pounded by Hurricane Harvey with more than 50 inches of rain, setting new records. But why has the city become a symbol of flood disasters?

Harvey and its devastation is only the latest in a decades long history of back-to-back events. The 2016 "Tax Day" flood that struck the city on the same day as the deadline to file federal income taxes and came just under a year after the Memorial Day 2015 flood. Both events produced more than a foot of rainfall and, combined, caused 16 deaths and more than \$1 billion in damage. While these events are less severe than Harvey, their cumulative effect reinforces the city's status as the most flood-prone city in the nation.

Climate change will bring even more frequent and severe rainfall to cities like Houston. Understanding factors that cause the increasing risk to life and property is critical to Houston's future and that of other cities facing similar threats.

The need for pro-active planning is greater now more than ever.

### Rapid Growth + Urban Sprawl

Unfettered, rapid growth is a key factor driving hazard risk and subsequent disaster losses. Houston's metropolitan area is fifth largest in the United States with a 2016 population of 6,772,852. It is one of the fastest growing metropolitan areas in the nation and the population is projected to top 10 million by 2040.

This growth alone is not necessarily a problem. Growth can produce economic development, jobs, and more investment in public services and environmental protection. But poorly planned and managed growth that fails to coordinate the location and design of housing, businesses, and public infrastructure (including roads, water, sewer, and open space protection) can lead to serious problems. Unchecked development in hazardous areas can result in catastrophe.

State and local officials in Texas have long taken a hands-off approach to planning for growth that is not backed by land use regulations, incentives, and public infrastructure investments. They have favored an unfettered, market-driven strategy for land use that allows haphazard development patterns across the landscape. The Houston region is ranked as having one of the highest levels of sprawl in the United States), which indicates that geographic growth of development spread across the landscape far exceeds population growth.



A transportation fleets sits stranded by Hurricane Harvey flooding. ©Tom Fitzpatrick, 2017.

## Paving Over Environmentally Sensitive Areas

Another associated problem of unplanned growth is the paving over of vast expanses of environmentally sensitive areas that absorb significant amounts of rainfall. In the case of Houston, wetlands and prairie land have been paved over, generating stormwater runoff during rainfall events. More runoff expands the geographic coverage of downstream floodplains and can exceed the capacity of the city's natural drainage ways of creeks and bayous, as well as flood control infrastructure such as levees and detention basins.

Harris County—home of Houston—is the third most populous county in the nation (4.4 million in 2014). With this growth has come a loss of vast amounts of environmentally sensitive areas. Between 1992 and 2010, for example, the county lost 30 percent of the freshwater wetlands.



Urban development in the Northwest Houston area in 1984 and in 2017.  
Source: Philip Berke, via Google Maps, 2017.

Widespread protection of environmentally sensitive areas would have some impact in reducing flooding from Harvey, but major reduction of flooding would not have been possible for this record-setting event. For less severe and more frequent floods, protecting environmentally sensitive areas could help make Houston less vulnerable by storing floodwater. Additional ecological benefits vital to the resiliency and quality of life of Houston would include cleaning polluted runoff, maintaining stream flow by gradually releasing water during dry periods, supporting recreation, and offering fish and wildlife habitats.

## Highways Prioritized Over Flood Control

Poor urban planning is often associated with an underinvestment in flood control infrastructure that does not keep pace with expansion. Houston is an auto-oriented city, with state and local investments in multi-billion dollar projects supporting one of the most advanced systems of roads and highways in the world. The core goals are to keep traffic flowing and make land readily accessible for real estate development on the city's ever expanding periphery. But state and local officials have demonstrated little consideration to the long-term consequences of all that concrete and development on flooding.

One striking example is the partially completed the Grand Parkway—State Highway 99. Once finished, this 180-degree loop will encircle a metro region that is about the size of Rhode Island. Another example is the recent widening of the Katy Freeway to 23 lanes. Unless proactive land use regulations are enacted, the unbridled sprawl generated by these multi-billion dollar mega-projects on the city periphery will cover vast expanses of land and generate large amounts of impervious cover.

Investment by the city and state in flood control falls short compared to highway building. The Sims Bayou watershed which runs through the southern part of the city exposed an additional 3,500 households to flooding between 1980 and 2000. This is the consequence of an increase of impervious surface by 15 percent, causing an increase in runoff that exposed more areas to flooding. In this case, expansion of the capacity of flood infrastructure to control flooding does not meet the growing demands of urban growth.

For more on lessons Houston might learn from other cities, please see Part II of this piece.

### About the Author



Philip Berke is professor land use and environmental planning and director of the Institute for Sustainable Communities at Texas A&M University in College Station, Texas. His research research focuses on land use and environmental planning, social justice in planning, and community resilience to hazards and climate change and spans the United States, China, New Zealand, Thailand, the Netherlands, and the Caribbean.





## Part II: How Houston Can Learn to Build Back Better from Other Cities

*Motorists drive through so-called nuisance flooding in Norfolk, Virginia. The city has enacted a vision plan to address frequent inundation. ©Will Parson, Chesapeake Bay Program, 2015.*

September 13, 2017

By Philip Berke

*This is a revised and expanded version of an earlier piece published by the BBC.*

The tragedy unfolding across Houston offers an opportunity to plan to rebuild a more resilient city. Urban growth is not itself the problem—development can reduce risk as well as produce more viable living conditions, jobs, and public health.

Developers and builders in Houston and surrounding areas have received short-term financial rewards while local governments have received an expanded tax base from unfettered development. But Harvey has opened a window of opportunity to change this conventional approach to the way the nation builds cities.

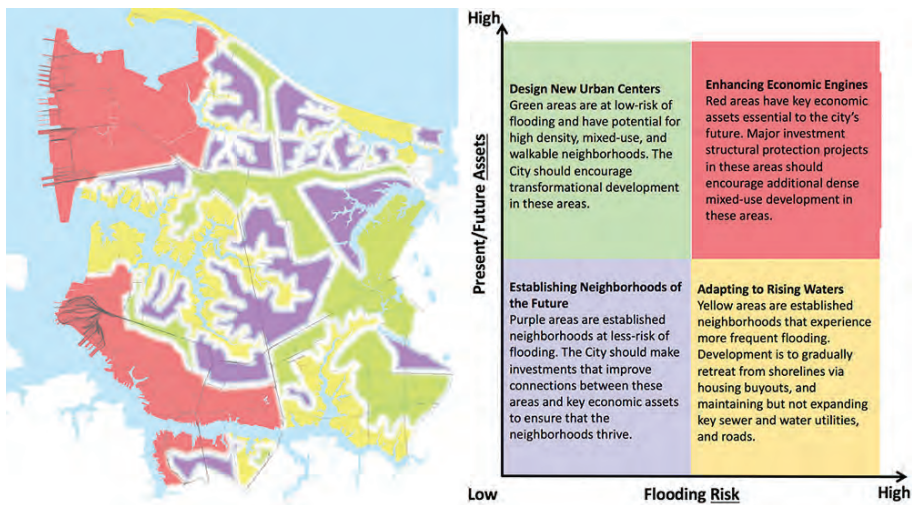
The risk presented by flooding has been passed to residents and the federal government. Public funds, especially from the federal government, bear an increasing share of the cost of disasters. The resulting moral hazard leads to continued development and redevelopment in high-hazard areas. The nation must stop subsidizing the development that costs taxpayers so much. Any government or corporation that chooses to pave over the landscape should pay the costs of that decision.

To survive on the Texas Gulf Coast in the coming century, Houston and its surrounding regions must guide growth with careful planning decisions and make massive investments in improving flood control infrastructure. A more unified vision to for better planning and management of risk and better coordination among federal, state and local governments is needed now.

### Innovative Proactive Planning from the United States and the Netherlands

Hurricane Harvey is a dramatic case of flooding. But the severity and frequency of urban flood disasters is growing around the world. There are an increasing number of innovative examples of cities taking on this challenge in the United States and elsewhere. Norfolk, Virginia, and Rotterdam in The Netherlands are two such cities.

Norfolk's response to rising exposure to coastal storms and sea level rise along the Atlantic Coast has been to adopt long-term strategies for guiding future land use and development. The strategies focus on different parts of the city, depending on the asset values and risk to flooding. In Norfolk, low-risk areas with limited development will be transformed into high-density and mixed-income neighborhoods. High-risk areas with essential assets will be protected by major flood infrastructure investments and land use policies that encourage dense mixed-use developments connected by transit lines. High-risk areas where neighborhoods are already established will be gradually withdrawn from shorelines using housing buyouts and by maintaining—but not expanding—key sewer and water utilities and roads.



Norfolk, Virginia's Vision 2100 includes land use strategies to address long-term vulnerability to coastal hazards and sea level rise. Source: Philip Berke, via [www.norfolk.gov](http://www.norfolk.gov).

Rotterdam provides another model. Situated on a major river delta, densely populated Rotterdam is Europe's lowest lying city with 90 percent of residents living below sea level. The city's pioneering solutions to flooding entail living with the water, rather than containing it. Flood control efforts take place within a regional flood protection framework that includes a complex levee system along the river, and massive flood control gates and sand dunes to prevent flooding from the sea.

Rotterdam recognizes that more flooding and rainfall is a growing possibility because of climate change. The city focuses on letting water in where possible, not subduing it through flood control. Rotterdam has installed underground garages, green roofs that absorb water, and water plazas that support urban vibrancy while serving as huge storage reservoirs during extreme rainfall or the overtopping of seas and rivers.

Norfolk and Rotterdam demonstrate that flooding and climate change are not an obstacle to economic development, but an opportunity. Indeed, both cities recognize that to achieve a vision of resilience requires including the broad and intensive engagement of residents, civic leaders, and experts in the city and beyond.

More than 50 years of natural hazards research has clearly established that with greater and more diverse stakeholder involvement, planning efforts are improved and the plans that are ultimately developed are more likely to be implemented. The cities highlighted here have planners who have aimed to open up multiple venues for participation in the planning process. This has led to more open dialogues where the public is informed about planning issues and able to voice their concerns and visions for the future. Cities that engage in these positive and proactive planning processes actively promote a shared understanding that communities are stronger and more resilient when everyone has the opportunity to contribute.



The water plaza in Rotterdam, Netherlands serves as a public gathering place, as well as a stormwater basin. ©Philip Berke, 2015.

## About the Author



Philip Berke is professor land use and environmental planning and director of the Institute for Sustainable Communities at Texas A&M University in College Station, Texas. His research research focuses on land use and environmental planning, social justice in planning, and community resilience to hazards and climate change and spans the United States, China, New Zealand, Thailand, the Netherlands, and the Caribbean.





## Who Lives Here? How Understanding Culture Reduces Suffering, Speeds Recovery, and Supports Resilience

*Johnson-Fernandez family Johnson-Fernandez family members gather for regular updates from their cousin Connie in the backyard of her Dallas-area home. ©Katherine Browne, 2005.*

October 23, 2017

By Katherine Browne

When Hurricane Harvey stranded thousands of people in Houston neighborhoods, emergency responders shared the call to duty with residents who rushed to save lives. One such initiative was Houston Harvey Rescue, organized by three men who used Google maps, Facebook, and a walkie talkie app to help coordinate hundreds of rescue efforts. Skilled boaters are part of Houston's cultural landscape, and in the aftermath of the storm, local people improvised to match available boaters to stranded residents. Houston Harvey Rescue also supplied critical local knowledge to outside volunteers, including the Cajun Navy.

The blending of such emergent efforts with official actions seems natural. Yet, the impulse to recognize local people as having relevant skills has to be learned. Why? Because institutions and organizations often see expertise as a credentialed, narrowly defined attribute. After a disaster, emergency managers often turn away what they call unaffiliated volunteers, but during major catastrophes, there are often not enough trained hands. When the relentless rains from Hurricane Harvey produced an epic scale of flooding, emergent groups of local volunteers were not turned away and, as a result, the reach of first responders was vastly extended. The capacity and resourcefulness of local people helped save many lives, almost certainly contributing to the low death toll and the successful rescue efforts.

This compelling example from the Harvey response phase can translate into a fuller, faster long-term recovery if disaster professionals tap into local values and strengths. Operationalizing this idea involves adopting a cultural lens of insight that begins by asking a basic question: Who lives here? This cultural lens works two ways.

First, it reveals that in every disaster, affected residents have distinct histories and ways of knowing and doing that become highly relevant to the success of their recovery.

Second, a cultural lens shows how organizations that attempt to help people recover operate according to their own cultural norms that shape the protocols and processes of recovery. Yet, as my previous work has shown, such "recovery cultures" devoted to helping survivors are rarely examined for the assumptions they make. Anthropological research has shown repeatedly how the embedded norms and expectations of groups dispatched to help often prove a poor match for meeting the embedded norms and expectations of survivors in a given area. As my book details, when the gaps between an organization's "recovery culture" and the "wounded culture" of local survivors are not addressed, misunderstandings and conflict can turn into unexpected struggles and dramatically increase the suffering of survivors.



*A family member prepares a crawfish boil for a family gathering in St. Bernard Parish. These get-togethers were especially important while the family was displaced. ©Katherine Browne, 2010.*

A Case in Point: My long-term, post-Katrina research with an African-American family of more than 150 people demonstrates how cultural values and practices take on special importance during collective loss and devastation. The storm hit hardest in St. Bernard Parish—the area where the Johnson-Fernandez family members had always lived.

Family members found refuge with a cousin, Connie, in Dallas. In her home, the family re-enacted their weekly routine of cooking gumbo and other seafood dishes that had brought family together to worship, eat, and share stories for generations. To maintain the social bonds of the family, the men made frequent 1,000-mile roundtrips to load up fresh seafood from home and bring it back for the gumbo queens to cook. Held together by cultural practices they could replicate, they remained optimistic through the months-long displacement.

When they returned to home ground, the family was ready and resolved to take on the challenges facing them. But the recovery system did not ask questions about who they were or what they needed. If recovery workers had asked, they would have understood that Federal Emergency Management Agency trailers were not enough to sustain large families. They would have realized that thousands of people in the area, including black families from the bayou, had long maintained their group strength and identity through regular gatherings that provided comfort, belonging, and a sense of control. The 240-square-foot trailers offered shelter, but not a solution for recovery. People jammed into this or that trailer could not easily share home-cooked food, stories, or childcare. And if not there, then where?

The weekly gatherings had sustained the family through every crisis in memory. But with no place to gather, those practices were drained of their potency and people began to suffer health consequences. In a painful irony, the recovery culture deprived the wounded culture of the energy it needed to thrive.

When people suffer great loss and collective upheaval, they require recovery efforts that support their homegrown style of resilience. In Houston's response phase, we witnessed a striking degree of local resourcefulness, but how will long-term recovery efforts support such adaptations? The answer will depend on a deeper awareness of who lives there and a clearer commitment to supporting local capacity that is powered by the strength of high-functioning cultural systems.

When disaster professionals act in partnership with those who understand the cultural strengths and values of affected populations, their help feeds the agency, efficacy, and recognition that mark the path to genuine recovery.

## About the Author



*Katherine Browne is professor of anthropology at Colorado State University. She and filmmaker Ginny Martin produced the documentary *Still Waiting: Life After Katrina* about the family noted above. Browne's book, *Standing in the Need: Culture, Comfort, and Coming Home After Katrina*, was published in 2015. She is co-founder of CADAN, the Culture and Disaster Action Network, of social scientists and disaster professionals.*



*The Johnson-Fernandez family pose together after far too many years of being forced down a path of recovery that created unnecessary suffering, health problems, and a lack of well-being of many members.*  
©Katherine Browne, 2015.





## A World of Disasters: Knowing More and Losing More

*Crowds throng in a densely developed street in New Delhi. More development and higher population is often blamed for increasing disaster losses, but there are more complex reasons. ©Joakart, 2014.*

June 10, 2018

By Ian Burton

Scientific understanding of “natural” processes—especially in this context extreme events—has advanced considerably in the past few decades. The magnitude, frequency, location, duration, speed of onset, and other characteristics of many hazards can now be predicted and forecasted with more accuracy and further in advance than before.

These advances allow for more warning time, better emergency preparedness, improved evacuations and other enhanced safety measures. Similarly, materials science and building design have progressed to result in better building codes and standards and more resilient structures. More precise geographical information about hazards helps avoid increased exposure to risk. Communication is faster and more reliable, and access to transportation has improved.

Why is it, then, that in the United States and the world in general, property and economic losses associated with extreme events in “nature” continue to rise even while relevant knowledge and understanding has also greatly increased?

### Possible Explanations for Why We Know More, and Lose More

Knowing more hasn’t helped to contain—let alone reduce—property losses, direct and indirect economic losses, and costly disruptions, although it should be noted that mortality and morbidity in disasters have declined significantly around the world. If knowing more enabled this success, especially in the more developed parts of the world, then why hasn’t it done the same for property and economic losses?

A common explanation for the growth in aggregate economic disaster losses is that the world population has grown considerably and with it the world’s economy and assets. The reasoning is that there is simply more people and more wealth situated in harm’s way. This is a partial explanation, but it is nowhere near sufficient. If this growth really was a major factor then one might expect that losses would increase in proportion to economic growth. It is true that disaster statistics and data on losses are of low quality and not highly reliable, but the data seems to indicate that the growth in disaster losses has outpaced that of population and economy. A more effective use of the available scientific knowledge and improved technology could surely have been expected to ensure disaster losses would decline.

Recently the science and policy communities have attributed growing disaster losses to climate change. There is now stronger evidence that some atmospheric extremes are, at least in part, due to climate change. The extent to which this applies to the frequency and the magnitude of extreme events is still a source of scientific exploration and debate. While climate change may already be a factor—and may well become more significant in future—it certainly is not the only driver for the present and past growth in disaster losses.



*European leaders meet to sign an action plan related to the Sendai Framework for Disaster Risk Reduction. ©European Committee Committee of the Region, 2016.*



Another often heard argument is that the better and increased knowledge has not been applied to the best advantage. Just “build back better,” as they say. Improvements are often promised after a disaster, and some are quickly made, often under the rubric of disaster risk reduction. Alas, these improvements are often small, incremental, not well sustained over time, and often leave out the most vulnerable residents. As a disaster recedes from memory, so does the determination to prevent recurrence. The perception of risk diminishes, and the collective thinking shifts to “not in my lifetime,” or “not while I am still living here,” or “not in my term of office.” Furthermore, the deployment of knowledge and technology can generate a false sense of confidence that the problem has been taken care of and won’t happen again.

The growth of the global economy, the onset of climate change, and inadequacies in the application of know-how, have all contributed in some degree to the growth in disaster losses. But even when taken together in aggregate they do not provide a sufficient explanation.

## Disaster Risk Creation

Another idea, sometimes called the cure-to-damage ratio, is gaining attention. This is the extent to which disaster risk reduction efforts (the cure) are overwhelmed by natural and technological processes that increase damage. This is beginning to be applied more to the climate change debate. Efforts to reduce greenhouse gas emissions and reduce concentrations are undermined by policies that promote the continued use of fossil fuels. These policies are aided by subsidies, tax breaks, and other support for exploration, extraction, processing, transport, and distribution and use. Are comparable processes at work in the disaster world? If so, what are the processes that contribute to disaster risk creation?

These questions received some attention during the negotiations for the Sendai Framework for Disaster Risk Reduction 2015 – 2030, which was adopted in 2015). Although Priority 1 of the framework is Understanding Disaster Risk, the overwhelmingly strong orientation is on disaster risk reduction, which is mostly taken to mean the reduction of existing or known risks.

It is encouraging to note that the preamble states “enhanced work to reduce exposure and vulnerability, thus preventing the creation of new disaster risks, and accountability for disaster risk creation are needed at all levels.” This thought is not flushed out in the text of the framework, but it is being taken up more widely in the disaster research community, which is encouraging.

One line of thinking is that the risk creation process is not just place or hazard specific, but that there are root causes that must be considered. Not only do environmental and social contexts produce cascading risks—as was so apparent in recent mega-disasters such as Hurricane Katrina in 2005, the 2010 Haiti Earthquake, and the 2011 Fukushima Disaster—but seemingly unconnected disasters could be linked by common underlying causes. Then what are such underlying causes and how might they be better identified and then addressed?

This is where a disaster risk creation framework becomes so important. It is crucial that with each new disaster event, we ask questions not only about the natural processes, but also about the social, political, and economic processes that put people and property in harm’s way in the first place. This is what a disaster risk creation discussion is all about.

## Reaching a Tipping Point

As risk creation continues unchecked, disasters are becoming larger and more frequent with more people affected each year. We are reaching a disaster tipping point. And these disasters will continue to happen until the threads converge and change becomes not only possible but inevitable. Knowing more is not enough. Understanding and action is what is needed.

### About the Author



*Ian Burton is professor emeritus in the Department of Geography and Planning at the University of Toronto. He previously served as director of the Institute for Environmental Studies, now School of the Environment. Burton is author of numerous books and publications on environmental hazards and risks.*



## Helping Those Most in Need First: Leveraging Social Vulnerability Research for Equitable Disaster Recovery

*A decade after Hurricane Katrina, Diamondhead, Mississippi is still a patchwork of empty, overgrown lots. ©Hazards and Vulnerability Research Institute, 2015.*

November 13, 2017

By Susan Cutter and Christopher Emrich

While emergency managers at all levels have shown an interest in identifying vulnerable populations before and after disasters, the ability to systematically measure or monitor social vulnerability—the differential disaster impacts on social groups based on pre-event social conditions and capacities to adequately prepare for, respond to, and recover from disruptive events—across a range of places has been lacking.

The development and implementation of the Social Vulnerability Index (or SoVI for short) into recent disaster response and recovery operations has helped fill this gap between science and practice. SoVI enables comparisons of social characteristics between places—specifically socioeconomic characteristics that contribute to a community’s disaster response and recovery capability. SoVI uses 29 different social and economic variables from the U.S. Census to represent a composite score of the underlying drivers of social vulnerability such as gender, social status, age, race and ethnicity, and wealth. In addition to producing a numeric value, SoVI outputs include a map illustrating relative levels (low, medium, high) of vulnerability. The social vulnerability index also provides detailed information about the drivers of vulnerability for specific geographic area of interest.

SoVI’s incorporation into the Federal Emergency Management Agency Geospatial Framework—a set of spatial products delivered to state and local emergency managers in times of crises—is a good example of translating vulnerability science to practice. While social vulnerability assessment is valuable for pre-impact planning, how useful is an informational product such as SoVI to response and recovery operations?

This question was put to the test during the historic floods of 2015 in South Carolina. Specifically, SoVI was leveraged into actionable intelligence and targeted response and recovery planning. The Governor of South Carolina appointed a disaster recovery coordinator and team with two missions: 1) accelerate recovery quickly across the entire state, and 2) develop recovery priorities in an apolitical fashion.

South Carolina relied on SoVI to identify priority areas requiring prolonged assistance in recovering from the disaster. For example, the South Carolina Disaster Recovery Office used SoVI to focus Voluntary Organizations Active in Disaster (VOAD) efforts in areas where help was needed most, rather than in the most accessible or convenient places, locations the media was focused on, or areas with potentially politicized needs. Further, when social vulnerability data were coupled with data from FEMA, the National Flood Insurance Program (NFIP), and Small Business Administration (SBA) to determine unmet needs, the remaining pockets of affected residents who needed additional resources for recovery were quickly highlighted.

The approach ultimately focused on those communities with high social vulnerability scores and the greatest damages and flood levels (shown in dark purple in Figure 1). It highlighted where volunteer organizations could prioritize resources to provide immediate relief, housing rehabilitation, and initial recovery. The use of SoVI gave state recovery personnel a much needed focal point for their recovery planning activities—one based on theory and measureable information. Implementing SoVI enabled the South Carolina Disaster Recovery Office to meet the governor’s mandate to take a non-partisan approach to distributing scarce disaster recovery dollars to those who needed it most.

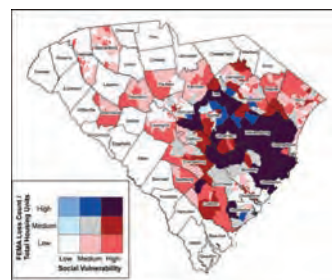


Figure 1. Illustration of disaster impact (FEMA-Verified Loss Count/Total housing units) and existing social vulnerability. The areas with the greatest need are shaded in dark purple (high impact and high social vulnerability). Map created by Christopher Emrich. Source: South Carolina Action Plan for Disaster Recovery, 2016.

Using the Social Vulnerability Index to allocate (often scarce) resources before, during, and after disasters allows for a clear and sustained unity of effort among organizations. More importantly, SoVI enables a fiscally conscious approach to resource allocation because it streamlines the process of targeting and prioritization and reduces political debates by local constituencies through an evidence-based approach.

Since 2015, state and federal emergency management teams have used this tool in Florida (Hurricane Matthew), Louisiana (floods), South Carolina (Hurricane Matthew), West Virginia (floods), and most recently in Houston after Hurricane Harvey (Figure 2).

Over time and across disaster contexts, our team has learned a number of important lessons from the deployment of SoVI as an operational tool for emergency managers. We conclude by sharing a few of those here:

### Learning Takes Time, But It Is Always Worthwhile

First and foremost, we recognized the steep learning curve of emergency managers in understanding SoVI's underlying architecture, as well as approaches to data interpretation and analytic limitations. The learning involved significant give-and-take between disaster scholars and practitioners in explaining social vulnerability both conceptually and practically. Once response and recovery teams and decision makers were confident in their understanding of the tool, its application, and its limitations, SoVI became widely used by state and local officials to identify unmet needs and target resources such as the planning and distribution of U.S. Department of Housing and Urban Development Community Development Block Grant-Disaster Recovery (HUD CDBG-DR) funds.

### Evidence-Based Decision-Making Matters

Second, SoVI converts decades of disaster research has taught us that marginalized populations without access to goods, services, information, and assistance are less able to rebound from disasters—into useable data. This evidenced-based measure quickly enabled targeted decision making rather than the typical one-size-fits-all approach employed during disasters.

### Knowledge of Social Vulnerability Can Translate into More Equitable Approaches

Third, the successful application of SoVI to numerous disaster response and recovery operations demonstrates the significant positive effect of using an evidence-based social vulnerability approach in the emergency management cycle, especially in the response and long-term recovery phases. It also adheres to the principles of good governance, social justice, and equity by helping those most in need first.

The social vulnerability index began as a conceptual model (1995-96) and turned into an empirical modelling challenge (1998-2002) before being translated into an evidence-based method for assessing disparities in hazard impacts across the United States. Since the seminal publication in 2003, SoVI has been refined and modified to reflect our current understanding of the drivers of vulnerability. It incorporates the most recent socioeconomic data in its construction. The widespread use of SoVI in the research arena is not confined to the United States as variants of SoVI are used worldwide. The real success in SoVI's timeline is the most recent application in assisting emergency managers to define the populations in the most need after a disaster and targeting response and recovery resources. In other words, translating disaster research into practice. This is what makes research count, after all.

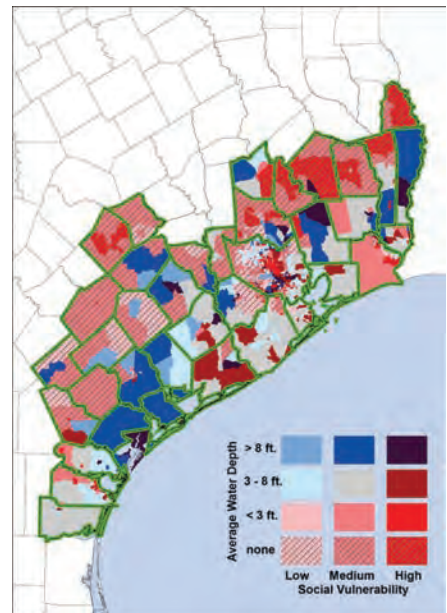
### About the Authors



*Susan Cutter is a Carolina Distinguished Professor of Geography at the University of South Carolina where she also directs the Hazards & Vulnerability Research Institute. Her research focuses on vulnerability and resilience science, especially disaster resilience indicators for communities.*



*Christopher Emrich is an Endowed Associate Professor of Environmental Science and Public Administration at the University of Central Florida where he is a founding member of the National Center on Integrated Coastal Systems. His research focuses on improving tools and technologies for emergency management decision making and community disaster recovery.*



*Figure 2. Illustration of disaster impact (flood depth) and existing social vulnerability. The areas with the greatest need are shaded in dark purple (high impact and high social vulnerability). Source: Christopher Emrich, 2017.*





## Infant Feeding in Emergencies: How to Support Families During Evacuation and Sheltering

*World Breastfeeding Week, celebrated August 1 to 7, helps support breastfeeding women to give their children the best start in life.*  
©UNICEF, 2017.

October 4, 2017

By Sarah DeYoung

Of all of the images captured in the wake of Hurricane Harvey, one of the most stirring was of a first responder carrying a woman and her infant out of floodwaters in Houston. As powerful as the image is, the reality is that the needs of infants and very young children are often overlooked in mass evacuation and disaster sheltering.

There are a high number of infants and young children living in all of the areas heavily impacted by Hurricanes Harvey, Irma, and Maria. According to the Texas Healthy Babies Report, there were more than 400,000 babies born in the state in 2015. In Harris County, where Houston is located, nearly eight percent of the population is below the age of five. In Hillsborough County, Florida, where Tampa is located, the 2016 birthrate was 12.8 percent. In Puerto Rico, 30,000 babies are born in each year (with 4.7 percent of the population under the age of five). During disasters infants are vulnerable. They need proper nutrition, hydration, and comfort. My research underscores the importance of safe feeding during emergencies.

### What Is Safe Infant Feeding?

Safe infant feeding is the process of providing nutrients that protect infants from illness, dehydration, and malnutrition. The safest form of feeding for infants under the age of six months is exclusive breastfeeding. Breastmilk provides all of the nutrition and hydration that infants need. Young children, toddlers, and infants over 6 months need access to nutritious and fresh foods. In an emergency, exclusively formula feeding families face the greatest risk as they need the most external support to keep their infants safe. They are in a food insecure position, where breastfeeding families have food security for their youngest member. In the response phase of a disaster, when a family and their infant is stranded without food or water for some time, breastfeeding has saved the lives of infants. This is one major reason why infant feeding support is a critical piece of emergency response.

Evacuation shelters also need to accommodate infants who are fed formula, either exclusively or in combination with breastmilk. However, it is often difficult or impossible to clean bottles and artificial nipples in shelters. In mass shelters, caregivers must often wash feeding supplies in the shared bathrooms where many hands touch the same surfaces where parents are trying to clean bottles, increasing the risk of contamination. Additionally, there are usually no provisions for people to boil water for sterilization of feeding supplies. Multiple families living in close spaces and a lack of infant-specific bathing spaces and proper diapering supplies can lead to gastro-intestinal outbreaks, food contamination, and rapid spread of illness. Therefore, providing safe and proper feeding spaces and supplies for families with infants is a key aspect of protecting the health and wellbeing of all evacuees.



*A mother feeds her child in a medical tent after the Bam Earthquake in Iran. ©Direct Relief, 2003.*

In the findings from my research on infant feeding in disasters, numerous families have reported that worry about feeding their babies added a layer of stress to the overall evacuation experience. Families evacuating might have multiple children that become anxious or bored in a sheltering scenario. Thus, providing a safe and quiet space for caregivers to feed their babies could also bolster mental health for families.

## What Are Key Ways to Support Safe Feeding as a Volunteer or Responder?

- Keep mothers/caregivers and babies together to ensure breastfeeding can continue through the acute phase of the hazard.
- Assess, empower, and support. Ask the mother how she was feeding the baby before the disaster and how she is feeding the baby currently. Support her by listening to her responses and her experiences.
- Refer the mother/caregiver to the resources needed for infant feeding (skilled lactation specialist, nutrition experts, and trained health workers).
- Make sure that mothers have safe, quiet places to breastfeed, such as mother-baby tents.
- Encourage pregnant mothers to breastfeed as soon as babies are born and remind new mothers to keep the baby skin-to-skin.
- If the infant requires formula, ensure that the caregiver has access to formula that is ready to use and addresses special nutritional needs or medical conditions, such as allergies.
- Ensure that instructions for infant and young child feeding in emergencies are available in multiple languages.
- In shelters, make feeding equipment disposable whenever possible—disposable bottles and nipples or cups are safer than those that require cleaning.
- Discourage donations of infant formula from groups and individuals. Instead, encourage cash donations to organizations that provide direct support to mothers and infants such as Save the Children, and other groups that adhere to the World Health Organization Code.
- Feed appropriate complementary solid food to older babies and toddlers, including fresh fruits and vegetables.
- Make sure that mothers in shelters know about breastfeeding hotlines; Women, Infants, and Children (WIC) resources; and other potentially lifesaving supplies and resources.

These steps and resources are not just important for shelter coordinators and health workers. Every person who works in a response, relief, or recovery capacity during a disaster can take part in making sure that infants are protected and that families are supported. Healthy families stand a greater chance of recovering from the disruptions and loss from the hazard event.

**For additional resources and information, the author recommends:**

Infant Feeding Support in Disasters (Safely Fed USA)

Texas Women, Infants, and Children

Florida Women, Infants, and Children

Puerto Rico WIC

Breastfeeding USA

United Nations High Commissioner for Refugees IYCFE Guide

Early Childhood Development and Emergency Feeding Programs

### About the Author



*Sarah DeYoung is an assistant professor at the Institute for Disaster Management in the at the University of Georgia. Her research focuses on protective actions and decision-making throughout the hazard cycle; socially vulnerable populations; community-based risk reduction in Nepal; and infant feeding in emergencies.*



## An Ongoing Disaster: Hurricane Maria's Potential Effects on Public Health

*An aerial view of damage to Puerto Rico from Hurricane Maria in late September.*

©Jose Ahirom Diaz-Ramos, Puerto Rico National Guard, 2017.

November 28, 2017

By Alexa Dietrich, Adriana Garriga-López, and Aman Luthra

Hurricane Maria made landfall in Puerto Rico on September 20, 2017. Two months have passed and people in Puerto Rico remain in immediate danger, with scarce electricity and limited access to water. Basic infrastructure functions that maintain water potability, food preservation, sanitation, and hospitals are either non-functioning or running on diesel-powered generators that rely on dwindling fuel supplies.

The humanitarian crisis unfolding in Puerto Rico in the aftermath of Hurricane Maria is rooted in a range of issues from inadequate planning, to the need for common-sense changes to emergency protocols, to the administration's failure to respond with urgency when lives are at stake. This last point highlights the profound impact of Puerto Rico's colonial status on the recovery process.

The islands' U.S. territorial status has meant continuing dependence on shipments of supplies and aid from the continent, with the federal government lifting the Jones Act restrictions on shipping to the island for only ten days. Aid from Venezuela was flatly rejected by the U.S. government despite a ship bearing thousands of meals requesting to dock, leading many observers to declare the de facto existence of a U.S. blockade of Puerto Rico comparable to the one imposed on Cuba.

The post-Maria reality in Puerto Rico is that infrastructure needs to be rebuilt almost from scratch. Environmental hazards are plentiful.

One urgent problem relates to waste management. When existing landfills are already full of toxic waste, as is the case with the municipality of Peñuelas, for example, dealing with large amounts of disaster waste poses an even greater challenge than usual. Poor water management can also lead to epidemics. Furthermore, Puerto Rico has experienced serious challenges related to the proper disposal of cadavers, a shortage of forensic pathologists, and a lack of consistent electricity to power morgues and laboratories.

We call for long-term recovery efforts to be informed by a holistic analysis that centers the health and well-being of Puerto Rico's residents. Puerto Rico has medical and other social needs that are rooted in a long history of U.S. colonialism and structural inequality; social facts that must be understood and accounted for as part of an effective and socially just disaster recovery strategy. These on-the-ground realities are central, not incidental, to the most basic structural rebuilding.



*Puerto Rico residents gather at a water distribution point to collect clean water for drinking, cleaning and cooking.*

©Paul McKellips, 2017.



Health-related emergency response is largely framed as being about immediate life-saving measures. However, once the emergency phase of a disaster of this scale is over, less attention is typically paid to the chronic aspects of public health and clinical medicine that are core to people's wellbeing. Hospitals may be rebuilt, but hospitals alone cannot be the sole sites of intervention for the community-based public health initiatives that are needed to help people to recover their mental and physical health over the long haul. Similarly, while proper management and disposal of debris in the immediate aftermath of a disaster is an emergency effort, long-term planning for municipal waste management is a chronic issue that must integrate health, environmental, economic, and social justice concerns.

Benjamin Paul noted in "Health, Culture, and Community" that successful public health initiatives begin "with people as they are and the community as it is," and goes on to say that "a willingness to meet them must be matched by a knowledge of the meeting place." The typically militarized control-and-command culture of disaster response agencies does little to recognize the specific weaknesses or strengths of local institutions and communities. It is presumed that in an emergency, a one-size-fits-all approach is sufficient. However, this approach often results in the diminution of the potential for local cultural resources to support resiliency and can be counterproductive.

In the case of Puerto Rico, there is also a significant lack of sufficient doctors and other medical personnel. Health care institutions are generally under-resourced, resulting in barriers to accessing medical treatments such as chemotherapy, dialysis, and HIV or other long-term medications. For example, Congress capped Medicaid on the islands, which meant that although the U.S. government covered an average of 57 percent of Medicaid costs for U.S. states, it only covered 15-20 percent of such costs in Puerto Rico. The deaths of many vulnerable people in the coming weeks and months will be registered as an outcome of chronic illness—but in reality these are the consequence of the ongoing effects of the hurricane.

Just as the notion of refusing coverage on the basis of pre-existing conditions is egregious, long-term recovery should be focused on treating the community as it actually exists after the disaster—to do otherwise is unconscionable. The question of whether a particular disaster "caused" a specific health outcome is an actuarial one, but it is not a humane one.

As scholars, we are working to address parallel issues in public health, waste management, and disaster recovery, emphasizing in particular the structural circumstances that influence overall community health and individual prognoses. The tight focus on emergency health measures in Puerto Rico keeps these insights largely absent from health-related analyses. Yet, it is imperative that they be foremost in planning for recovery in the days, months, and years ahead.

## About the Authors



*Alexa Dietrich is program director at the Social Science Research Council and an associate professor of anthropology at Wagner College. Her book, *The Drug Company Next Door: Pollution, Jobs, and Community Health in Puerto Rico* (NYU Press, 2013) won the Julian Steward Award for the best book in environmental anthropology in 2015.*



*Adriana Garriga-López is an associate professor of anthropology at Kalamazoo College in Michigan. Garriga-López's work focuses on the public health effects of Puerto Rico's political subjugation to the United States, with an emphasis on contagious disease. She was born and raised in San Juan, Puerto Rico.*



*Aman Luthra is an assistant professor of anthropology and sociology at Kalamazoo College in Michigan. His work focuses on the political economy and ecology of informal infrastructures of waste management in developing countries.*



## Some Lessons from Katrina

*Steps to a place where a home once stood in the Lower Ninth Ward. ©Lori Peek, 2013.*

December 8, 2017

By Kai Erikson

The hurricane that crashed into the Gulf Coast and the floodwaters that inundated most of New Orleans, both known as “Katrina,” were devastating events by any human standard, and it makes good sense to assume that they were the primary cause of the deep emotional suffering that followed. But it will be very important for those now trying to assess the amount of harm taking place in more recently damaged locations like Texas, Florida, and Puerto Rico, to realize that this form of suffering is very likely to continue long after the winds subside and the waters recede. For many people, “recovery” will not be a steady climb out of misery as broken structures are repaired and broken spirits are attended to. It will be a long period of time during which new forms of traumatic reaction come to the surface. The initial strike, that is, transforms the social atmosphere in ways that bring about other sources of shock and anguish. Three examples:

First, it was a frequent finding in the years following Katrina that the recovery process itself became so frustrating and dispiriting for some survivors that it outranked the disaster itself as a source of real distress. When agencies like FEMA came to town to distribute funds to the urgently needy, for example, they often proceeded in a manner that simply bewildered the persons they had come to help. The ways of a federal bureaucracy came into contact with the ways of a severely damaged community, and each operated with a different sense of what constitutes reality, a different sense of how to relate to fellow human beings. The exchanges that followed could not reach across that wide abyss a good part of the time. Many thousands of desperate people simply gave up trying, and many thousand more had to settle for funds that did not even come close to reflecting what they had good reason to think they were entitled to. FEMA counted that as an inconvenience; survivors were more likely to count it as a grave source of traumatic injury.

Second, it was a frequent finding in Katrina that survivors of the storm began to feel that they had lost a secure foothold in the setting they called home. That was obviously the case for people who were displaced by the storm and were not able to return home for long stretches of time, sometimes forever. But it was also the case for persons who did not move an inch from their original niche on the surface of the earth but came to feel that the land they occupied or the spaces surrounding it were no longer home-like. They, too, had become strangers in an unfamiliar landscape. That feeling can hurt to the very core, all the more so for persons who see themselves as belonging to – being an intimate part of – a particular place. In both cases, “uprooted” can be the right word for what happens in human life as it is in plant life: to be wrenched from one’s natural turf, in fact or in perception, is, almost literally, to wither.

Third, it was a frequent finding in Katrina that persons who encounter that kind of shock come to feel that they have been abandoned by the social order they thought they were members of. Their nation, their state, their city proved to be as indifferent and as heartless as the hurricane that attacked them without warning. That can be a truly terrifying realization: that they are now alone or part of a lonely cluster of people out on a barren plane where the supports they once thought they could count on – government, home town – no longer show any evidence of truly caring. This is a trauma that can continue for years, decades, lifetimes.

It does not help that what happens long after a storm event so often continues to be known by the code name assigned it by meteorologists long before the first hint of it even appears on the horizon: Katrina, Harvey, Irma, Jose, Maria. That familiar habit can hardly help but suggest that the horrors inflicted by the storm itself are what really matter. Nor does it help that the clinical term we employ to identify the mental suffering that follows is PTSD, Post-Traumatic Stress Disorder. The “Post” suggests that even the symptoms which appear long after the storm event itself are nonetheless a reaction to what happened then. And, in a way, it also suggests that recovery can be expected to begin as soon as the initial shock disappears. A number of psychiatrists, having learned that rates of PTSD remained as high years after Hurricane Katrina itself slipped back into history, described those symptoms “Delayed Onset Post-Traumatic Stress Disorder.” Read carefully, that can only mean that reactions to the storm and the flooding had not really worked their way into human consciousness until a good deal later. But it makes far better sense to conclude that those symptoms are a product of the aftermaths rather than of the original blow.

And it is very important to keep in mind, too, that African-Americans as well as other minority populations are far more likely than their white compatriots to be susceptible to those forms of injury. The reasons for that are obvious on their face. Black persons – and we should probably add a “brown” to that color code so as to include the people of Puerto Rico – are more likely to live in poverty, to be more vulnerable to most of life’s misfortunes, to be dismissed by their white fellow citizens. But it has to be added to that cruel list that they are also far more likely to have been exposed to traumatic blows long before the appearance of a disaster – and for exactly those same reasons.

Footnote: Reports about the relative ineptness of FEMA and other federal agencies in the time of Katrina have been circulated widely and appear to have had some noticeable effect. Or so we must hope. But very little has been said about the process by which federal funds made their way through the market economy on their way to the persons they were meant to help. The evidence from Katrina, at least, strongly suggests that those funds passed from contractor to contractor to contractor – each station-stop on that journey taking a substantial share of the allocated funds. There are good reasons to suspect that the sums that actually reached the persons they were intended for were no more than a small portion of the original allocation. Several experienced observers who followed the siphoning-off of those rescue funds concluded that it was far and away the most egregious form of “looting” to result from Katrina. So individuals responsible for receiving federal funds in the damaged disaster sites and distributing them to the persons for whom they were intended should be advised to trace their path from Washington to Texas, Florida, and perhaps especially to Puerto Rico, with special care.



House in the 8th Ward following Hurricane Katrina  
©Steve Kroll-Smith, 2005.

## About the Author



Kai Erikson is a William R. Kenan, Jr. professor emeritus of sociology and American studies at Yale University; former president of the American Sociological Association; chair of the Katrina Task Force, Social Science Research Council; series editor of “The Katrina Bookshelf,” University of Texas Press; and fellow of the Natural Hazards Center.





## Supporting Children in All the Spheres of Their Lives: Lessons from Katrina

*"What Katrina Looked Like," by Joseph, 10-years-old at the time of the storm. ©Lori Peek, 2007.*

October 6, 2017

By Alice Fothergill and Lori Peek

The destruction that has unfolded in the wake of Hurricanes Harvey, Irma, and Maria reminds us of the hardships we witnessed in the aftermath of Hurricane Katrina in 2005. Following that terrible storm, we embarked on a seven-year-study of the recovery experiences of children and youth from New Orleans.

We believe the lessons from Katrina can help now. Indeed, what we learned from those young people, their families, and their teachers can be of use to those providing aid and assistance to the children affected by recent major disasters. We found that the children of Katrina did many creative things to help other children. Adults, too, mobilized resources and invested in organizations and institutions to fight for more positive outcomes for children.

In the spirit of assisting the most recent survivors, we offer six groups of recommendations that came out of our research. These are based around what we refer to as the "spheres" of a child's life.

### Family

First and foremost, children need routine and predictability in their family life. They also need compassion, as children might be dealing with other simultaneous crises, such as divorce or illness in their families. Children whose families have few resources are especially in need of these forms of support, information, and opportunities. Single parents, often mothers, need additional support, such as trustworthy childcare services, during displacement.

For children who are displaced, they need clear, meaningful information about their extended family members. Ideally, they should have a chance to communicate with them and be reassured that their displaced family members are safe and that they will see them again.

### Housing

In temporary shelters, children need child-friendly spaces to rest, play, and study; adults should be present to protect and comfort them. Shelters should consider feeding needs, privacy, and safety for infants as well as older girls, boys, and transgender children and youth. If possible, it is beneficial to offer safe outdoor spaces for children to play both around shelters and in temporary housing sites. During the emergency period and the rebuilding, emergency managers and planners should be cognizant of accessibility for children with disabilities.

As the recovery and rebuilding process begins, we recommend that housing assistance be a funding and policy priority, especially for low-income renters. Temporary housing should be carefully screened for the health and safety of children and youth, whose bodies are more susceptible to mold and toxins. As the children of Katrina taught us, displaced residents, even the youngest ones, should have a voice in communicating and shaping post-disaster housing options.

### School

Educational continuity is key to recovery, and thus affected children need to resume their education and get back to a predictable school routine as soon as possible. Resources for the repair and reopening of schools are critical, as well as resources and support for those schools receiving displaced students from the disaster zone.

Schools could offer optional peer-oriented and/or peer-led groups, and programs should support schools to ensure they have licensed professional counselors, social workers, and school therapists to help onsite. Training school staff to provide support to students and know how to recognize signs of distress is highly valuable. Lesson plans and assignments can be designed to engage students in projects relevant to their lives (such as risk mapping) and support them (such as with art therapy).

Children and youth need opportunities to help others, so provide them with chances for projects such as service learning, fundraising, community action, or mentoring. Teachers may also be recovering from the disaster, and thus short- and longer-term support for them is important.

## Friendship

The importance of friends and peer groups during displacement is often overlooked and should be recognized and supported. Children need to locate and reconnect with their friends in the aftermath of disaster. Helping them communicate with them—through calling, texting, or social media—can lessen their fears and concerns about their wellbeing. As children and youth find themselves in new, unfamiliar surroundings, they may need help adjusting to new peer groups and making new friends, so “buddy programs” are helpful.

## Extracurricular Activities

For children who are involved in sports, a religious institution, or organizations like scouts or 4-H Club, this sphere of their life often allows them to discover skills and strengths and to develop social networks outside of family and school. In the aftermath of a disaster, children often lose access to such important extracurricular activities. As children either return to the disaster-affected neighborhood, or settle into a new place, they should have the opportunity to be involved in age-appropriate activities. To help facilitate that, they may need help with transportation, fees, and uniforms, among other things. Children and youth also benefit from being able to share their experiences through creative mediums, so providing them a space for writing, art, theater, and dance is recommended.

## Health and Well-Being

The emotional and physical health and well-being of children is a fundamental part of their recovery. Health and well-being are not distributed equally—low-income children and children of color face more health challenges during non-disaster times, such as food insecurity and asthma, and have less access to affordable, high-quality health care.

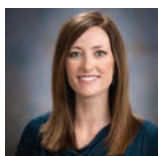
Children’s physical and emotional health are interconnected, and they should receive care for both. This means that in a post-disaster period, they may need to be taught how to make healthy choices for their bodies. Children need fresh air, exercise, and an environment free from environmental risks, such as spilled oil, sewage, asbestos, black mold, mildew, and contaminated soil. Their exposure to hazardous materials in the rebuilding process should be limited as much as possible. Since disaster effects are often enduring, children need access to long-term emotional assistance.

Children, and especially the most socially disadvantaged children, may have simultaneous and ongoing needs in all spheres of their lives. As we watch the recovery unfold from the historic storms of 2017, we are reminded of how critical it is that attention be paid to the youngest survivors of disaster and that collectively we prioritize their needs.

## About the Authors



*Alice Fothergill is professor of sociology at the University of Vermont. She is the author of *Heads Above Water: Gender, Class, and Family in the Grand Forks Flood*, co-editor of *Social Vulnerability to Disasters* (first and second editions), and co-author, with Lori Peek, of *Children of Katrina*.*



*Lori Peek is director of the Natural Hazards Center and professor in the Department of Sociology at the University of Colorado-Boulder. She studies vulnerable populations in disaster and is author of *Behind the Backlash: Muslim Americans after 9/11*, co-editor of *Displaced: Life in the Katrina Diaspora*, and co-author of *Children of Katrina*.*



## Who Will Protect Recovery Workers after Hurricane Harvey?

*Workers recruited for post-Katrina reconstruction efforts rally in 2008 after being held against their will and forced to work in deplorable conditions. ©Barb Howe, 2008.*

September 10, 2017

By Elizabeth Fussell

Recovery from Hurricane Harvey is going to take years, if not decades. As someone deeply concerned about the health, safety, and wellbeing of recovery workers, I want to know who will protect those who will do the work associated with flood cleanup and rebuilding.

The George W. Bush administration took a quick and dirty approach to Hurricane Katrina cleanup—they suspended federal regulations that guaranteed environmental, labor, and health standards in the disaster zone and ensured competition in federal contracting. In addition, the administration suspended immigration enforcement—since many immigrants affected by Hurricane Katrina might have lost their documents in the disaster, employers were not required to ask for proof of employment eligibility. These actions enabled construction contractors to obtain large federal grants and to hire any workers that would accept the standards established by employers.

As Texas and the nation now confront the recovery from Hurricane Harvey, it is worth taking a closer look at the effect of those suspensions.

The suspension of the Competition in Contracting Act allowed no-bid contracts that paid construction contractors the estimated cost of a job plus any additional costs. As a result, recovery spending skyrocketed, often without comparable results. One way that costs rose was from hiring multiple layers of subcontractors, each of whom took their share of profits before the work was accomplished. Since subcontracts were allocated through the contractor networks, many Louisiana construction companies, whose businesses were damaged in the disaster, and their employees who were seeking work, were shut out from the recovery labor market. In other words, discriminatory contracting allowed local residents and construction companies that could have benefited from the federal enforcement of these laws to be excluded.

The post-Katrina suspension of the Davis-Bacon Act meant that employers with federal grants were not required pay their employees at the wage levels, with benefits and overtime, that prevail in a particular region. This means that those hired to perform construction labor on federally funded projects did not have to be paid a fair or living wage. Other suspensions meant that employers did not need to apply affirmative action in hiring or require workers to prove they were eligible for employment in the United States. Furthermore, by suspending the enforcement of Occupational, Safety, and Health Administration (OSHA) standards, there was no workplace oversight. Any violation of a worker's rights was only enforced on the basis of worker complaints after the fact.

So how was the post-disaster construction labor force generated? While large- and medium-sized construction companies brought in out-of-state workers, many small contractors and homeowners recruited workers from the day labor pickup sites that sprung up in the New Orleans metropolitan area. These workers hauled debris, gutted homes, and installed tarps on damaged roofs—all while living in, damaged abandoned houses, moldy hotels, or tents in City Park. Many were unauthorized immigrants from Mexico and Central America who were already in the United States when the storm hit. Others were U.S. citizens and legal residents from the region who came to help the struggling city and earn a living. Still others were temporary guest workers recruited by employers through the federal H2B visa program. These workers were subjected to dirty and dangerous work in a toxic city, a scenario that is re-emerging in Houston as the toxic floodwaters seep into wreckage that will need removal, as well as the groundwater and soil that remains.



In October 2007, more than two years after the Katrina disaster, Congress heard testimony from workers in a hearing that looked at the Department of Labor's performance in investigating and prosecuting wage and hour violations and protecting guest. The testimonies were riveting and stand as historical documentation of workers' terrible working and living conditions, the abuses they faced, and the indifference of the federal government in redressing these abuses.

One worker, Jeffrey Steele, summarized his situation, and foreshadowed our situation now:

*"I went to New Orleans to help and to be part of history. I did the dirty, hard clean-up work that was needed. But, like a lot of other workers, I was taken advantage of by contractor after contractor. I have been seeking justice, but haven't seen it yet... This is not about [me] – it's about the small men and women, like me, who don't have a voice. There may be another disaster like this in some other state and town. Who can tell me how workers will be treated? Can you tell me who will protect us the next time?"*

Hurricane Harvey is the next time. Now is the time to prevent the worker abuses that we saw after Hurricane Katrina. That means enforcing, rather than suspending, policies and protections that are in place to protect workers.

### About the Author



*Elizabeth Fussell is an associate professor of population studies and environmental studies at Brown University in Rhode Island. She lived in New Orleans when Hurricane Katrina struck and has researched the long-term recovery of the city and its residents—in New Orleans and elsewhere—for the past 12 years.*



## Preparing the Whole Community: Including Homelessness in Disaster Planning

A church provides cots for the homeless during especially cold weather. ©Taylor Pecko-Reid/KOMU8, 2017.

January 31, 2018

By June Gin

Individuals and families who are homeless are among the most vulnerable members of our society because of their limited resources, social isolation, and the prevalence of health conditions. Disasters amplify these conditions, as the social safety nets that the homeless rely on during non-disaster times can be disrupted and even shut down at a time of surging demand.

The hurricanes, floods, and wildfires of 2017 vividly illustrated the amplified risks that people who are homeless face during catastrophes and the barriers they encounter during community recovery. During the San Diego Hepatitis A outbreak, Hurricane Irma, and the California wildfires, individuals experiencing homelessness were perceived as threats due to social stigma and negative perceptions. They also experienced challenges in communities that didn't fully incorporate the realities of homelessness into plans for emergency response or disaster mitigation. For instance, homeless individuals might not evacuate or take other life-protective measures because of lack of information and distrust of messengers.

This past year also saw the first rise in the U.S. homeless population in nine years; driven largely by an affordable-housing crisis in West Coast cities such as Los Angeles and San Francisco. In 2017, 554,000 individuals were homeless on a given night in the United States. Disasters make these housing shortages even more dire for individuals who are trying to find homes. Integrating people experiencing homelessness into disaster planning is a challenge for many communities. Homeless service providers are not always well connected to emergency management and disaster relief organizations; local community-based organizations (CBOs) can lack plans that ensure the ability to provide post-disaster services; and healthcare services for people experiencing homelessness may not be readily available. Many of the CBOs that provide essential daily services and help individuals overcome homelessness have not taken preparedness actions, particularly continuity of operations planning to ensure they can continue delivering vital services.

To address these challenges, a new evidence-based toolkit—*Disaster Preparedness to Promote Community Resilience: Information and Tools for Homeless Service Providers and Disaster Professionals*—offers communities research-driven resources and guidance to ensure that the needs of individuals experiencing homelessness are included in disaster planning, response, and recovery. A federal interagency team of researchers and practitioners developed the toolkit by consulting with more than 50 subject matter experts in emergency management, public health, and homeless services to distill best practices and lessons learned.



Volunteers and staff prepare food to be served at homeless shelters at D.C. Kitchen. ©Tom Witham/U.S. Department of Agriculture, 2012.

The toolkit provides an overview of the challenges that occur during and after disasters and the impact of those challenges on people experiencing homelessness. It provides guidance that will help homeless service providers and emergency managers develop partnerships that address the disaster needs of homeless individuals. It also outlines strategies to avoid disruption of services for homeless-serving CBOs and healthcare providers. The toolkit also includes tips for healthcare settings to ensure that they are adequately staffed with providers experienced in serving people who are homeless.

The toolkit is divided into three sections:

- Creating an Inclusive Emergency Management System
- Guidance for Homeless Service Providers: Planning for Service Continuity
- Guidance for Healthcare Providers

Communities that are engaged in best practices reap the benefits of increased collaboration. San Diego's 2017 Hepatitis A outbreak prompted public health officials to build stronger ties with homeless outreach organizations to set up handwashing stations that curb disease spread. My colleagues across the country have similar examples to share. For instance, during Hurricane Sandy, Philadelphia's public health department collaborated with CBOs serving at-risk populations to encourage people living on the street to take shelter.

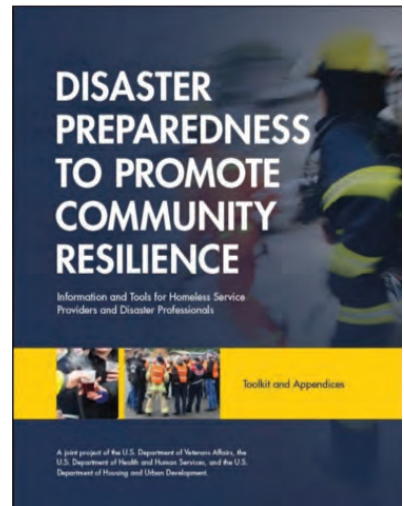
Similar measures were taken in Florida during cold weather episodes, when formerly homeless veterans residing in transitional housing participated in outreach to those living in homeless encampments. After Hurricane Irma, the Florida American Red Cross chapters built on their strong relationships with homeless organizations to help individuals in shelters find permanent housing. Not only did this relationship prevent hurricane-affected individuals from becoming homeless, it also enabled the Red Cross chapters to close the disaster shelters more quickly. As a living document, the toolkit uses lessons like these to exemplify partnerships that make communities more resilient.

*The toolkit is a joint product of the U.S. Department of Veterans Affairs Veterans Emergency Management Evaluation Center (VEMEC), the U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response, and the U.S. Department of Housing and Urban Development Special Needs Assistance Programs Office. For more information, please contact June Gin at [june.gin@va.gov](mailto:june.gin@va.gov).*

## About the Author



June Gin is a Research Health Scientist at Veterans Emergency Management Evaluation Center, with extensive experience in community organizing, capacity-building, neighborhood planning, non-profit organizations, and community resilience. She leads two projects: 1) a national effort to develop a toolkit for disaster preparedness, response, and recovery for homeless service providers; and 2) a study on disaster preparedness in Los Angeles County homeless shelters and transitional housing.







## People Matter: The Social Element of Disaster Response and Recovery

*Rebuilding after Hurricane Katrina in New Orleans. @Mercatus Center at George Mason University, 2009.*

October 10, 2017

By Stefanie Haefele and Virgil Henry Storr

With hurricanes threatening the United States and the Caribbean, wildland fires raging in the West, earthquakes rocking Mexico, and floods ravaging southeast Asia, people may be left feeling hopeless and uncertain about how to recover. This is understandable—rebuilding is expensive and recovery is a long and daunting process.

Where there is community, though, there is reason for hope. Community—defined here as our leaders, relationships, and social ties—is a crucial resource that is vital to making recovery happen.

We have found that local leaders and enterprising residents can reduce the burdens of recovery, increase the benefits of returning, and increase the likelihood that others will also return. They do this by being a focal point for the distribution of goods and services, the restoration of social networks, and the collective action needed to solve common problems.

Our research team interviewed hundreds of people who returned to New Orleans and those who decided to stay in Houston after evacuating after Hurricane Katrina. We also conducted fieldwork on the Rockaway Peninsula in New York after Superstorm Sandy. In each neighborhood we visited, we learned about the people who helped facilitate recovery.

### Providing Goods and Services

After a disaster, supplies are typically limited and needs are extensive. Early estimates show that Hurricane Harvey caused more than \$150 billion in damage and Hurricanes Irma, Maria, and Nate caused significant damage throughout the Caribbean and United States.

Local commercial and social entrepreneurs can help their neighbors obtain resources. They do so by reopening their businesses, such as coffee shops or furniture stores, or by identifying a new need within their community, such as a health clinic or a youth advocacy group.

These entrepreneurs also help facilitate the provision of goods and services by connecting those who need aid with those who can supply it. This often entails finding effective ways to attract donations and distribute them among members of the community. For example, after Superstorm Sandy, an orthodox Jewish community in Rockaway, New York, used a fund that was originally intended to help neighbors during the recession to take in donations. The Community Assistance Fund raised more than \$11 million and distributed it in three phases, providing emergency funds, home repairs, and major rebuilding. Members of the community also surveyed the neighborhood and tracked unmet needs. When people and organizations reached out to provide donations, they were able to reference their list for the exact donations they needed the most.



*Scholars interviewing residents and business owners after Hurricane Katrina in New Orleans. @Mercatus Center at George Mason University, 2007.*

## Restoring Social Networks

Contacting family, neighbors, and coworkers can be a challenge during and after a disaster. Cellular service is often overloaded and evacuees can be dispersed across states, making it difficult to communicate and coordinate plans. Consider that days after Hurricane Maria devastated Puerto Rico, people in the mainland United States (including Supreme Court Justice Sonia Sotomayor) were still unable to contact friends and relatives on the island.

We know from our research and the research of others that social capital after disasters is an important source of material support, critical information, and community mobilization. After Hurricane Katrina, local leaders used the contact logs of their neighborhood associations and religious organizations to reach residents, help them return, and share information. After Superstorm Sandy, a youth group on the Rockaway Peninsula rallied volunteers and supplies through social media, as did numerous other groups around New York.

## Overcoming Collective Challenges

Local commercial and social entrepreneurs also help residents overcome common challenges. As Texans showed in the days and weeks after Hurricane Harvey devastated Houston, their do-it-on-our-own attitude saved lives. Enterprising residents will need to establish formal and informal support systems not only to aid in physical rescue, but for emotional recovery as well, including relieving the stress and anxiety children face after disasters.

Even filling out the paperwork for government assistance can be difficult, especially for the disadvantaged residents who may not be adroit at navigating formal bureaucratic processes. But, residents can learn from and help one another to improve their outcomes. After Hurricane Katrina, community leaders and pastors helped neighborhoods organize to resist recovery plans that didn't make sense for their neighborhoods, and appealed to the Federal Emergency Management Agency on behalf of community members for trailers and assistance. Likewise, neighbors came together to hire contractors and order equipment, which helped save money and time during rebuilding.

Now, as residents of communities around the globe deal with a series of disasters that threaten to overwhelm public assistance, local leaders and enterprising residents will once again come to one another's aid. Encouraging neighbors to respond to emergent and ongoing needs and to help one another will help speed recovery and further strengthen their communities.

### About the Authors



*Stefanie Haeffele is a senior research fellow and deputy director for Academic and Student Programs at the Mercatus Center at George Mason University. She co-authored Community Revival in the Wake of Disaster: Lessons in Local Entrepreneurship with Virgil Henry Storr and Laura Grube. Her research focuses on post-disaster community recovery and the role of nonprofit organizations in providing social services.*



*Virgil Henry Storr is a research associate professor of economics at George Mason University and the senior director of Academic and Student Programs at the Mercatus Center. He is the author of several books including Understanding the Culture of Markets. His research focuses on the role of entrepreneurship and social capital in promoting post-disaster community recovery and the social and cultural aspects of markets.*



## Intricate and Uneven: Housing Recovery in Coastal Communities

*A home near Galveston, Texas, is completely destroyed after Hurricane Ike. Tourist communities like Galveston face the need to recover both year-long and seasonal housing after disaster. ©Patrick McKay, 2008.*

June 11, 2018

By Sara Hamideh

A significant share of disaster-related losses and disruption is caused by housing damage and the resulting population relocation. In coastal communities with large tourist economies these losses affect both year-round households and seasonal housing markets. After disaster, when pressure on these different housing markets is often especially strong, reestablishing housing becomes essential to overall community recovery and to the economic, social, and psychological recovery of households. Despite this essential social and economic fact, certain housing types and housing markets in coastal communities are often overlooked in the disaster recovery process. This article explores what might be done to address this issue.

### Local Economies and Housing Submarkets in Coastal Communities

Every year hurricanes pose a significant threat to communities along the U.S. Gulf and Atlantic Coasts. Yet, the coastal environments of these communities shape their economies by providing opportunities for tourist activities, as well as forming housing submarkets. Tourist-based coastal communities have a combination of traditional residential housing submarkets—including year-round owner-occupied and rental homes—as well as neighborhoods with high concentrations of seasonal homes. A seasonal housing submarket is a mix of second homes that are occasionally occupied and full-time vacation rentals and timeshares.

While seasonal rentals and second homes meet the demand of tourists, year-round affordable owner-occupied and rental homes often accommodate a local low wage labor force that is vital to a thriving tourist economy. Hence, bringing back seasonal homes as well as rental and affordable housing, is essential to recovery of both the residential sector and the local economy in these places. Nevertheless, research shows that both affordable year-round and seasonal housing recover more slowly than other residential types.

### Impact and Recovery Disparities in Different Housing Submarkets

Galveston, Texas, is a barrier Island with sizeable seasonal and year-round housing submarkets. After Hurricane Ike, the city's owner-occupied, year-round homes—most of which are protected by a seawall—sustained less damage and were restored more quickly than vacation homes. Seasonal homes with higher levels of damage have very slow recovery trajectories that can hold back recovery of the local economy, as well. More severely damaged rental and owner-occupied, year-round housing in lower-income minority neighborhoods suffer more damages and lag in recovery behind owner-occupied homes in predominantly white middle-class neighborhoods.



*Housing recovery work underway on the Bolivar Peninsula following Hurricane Ike. ©Patrick Feller, 2010.*



Housing recovery policy in the United States, because of its focus on single-family, owner-occupied housing and neglect of single- and multi-family rental housing, plays an important role in shaping these inequalities. Recovery of seasonal housing after disasters is driven by different decisions and resources than those of year-round homes. Unlike vacation rental or second home owners, year-round owner-occupants frequently have a range of potential resources for repairs and rebuilding—savings, insurance, low-interest Small Business Administration (SBA) loans, and assistance programs such as the Federal Emergency Management Agency minimum home repair and more recently U.S. Housing and Urban Development (HUD) Community Development Block Grant Disaster Recovery (CDBG-DR) funds. Furthermore, repairing or rebuilding of vacation homes often involves business decisions about expected earnings versus the costs of repair or reconstruction, factors that are rarely as influential for deciding whether to restore a year-round residence.

## Planning for Housing Recovery in Coastal Tourist-Based Communities

Research has demonstrated the importance of planning for successful and equitable community recovery in general and for housing in particular. Recovery planning should account for the intricacies of coastal communities when planning for housing recovery. This includes planning for various housing submarkets, accounting for the decision-making tendencies of owners of different types of housing, and addressing the social vulnerability of residents. Research on tourist-based coastal communities provides four main takeaways for housing recovery planning.

First, the significant impact of damage on recovery, particularly in the vacation markets where recovery resources are limited, further validates the need for coastal communities to reduce damage and enhance resilience. This can be achieved by strengthening building codes to ensure properties are properly elevated and improving free-board requirements.

Second, to tackle the problem of rental housing recovery, local communities can take advantage of more flexible HUD CDBG-DR funding to establish funding mechanisms that might potentially address part of this issue.

Third, recovery assistance programs for coastal communities with a large tourism sector should allocate a wider range of resources and financing options to support repairs and rebuilding for seasonal and second homes, particularly for seasonal housing with more severe damage.

Fourth, recovery disparities across income levels and racial groups highlight the need for income-targeted housing recovery assistance for year-round residents in order to address the needs of lower income households.

When we start taking these steps, we will have begun the long journey toward more resilient housing and economies in our coastal communities.

### About the Author



*Sara Hamideh is an assistant professor of community and regional planning at Iowa State University. She studies housing recovery inequalities after disasters to identify resource needs and effective recovery policy levers. In her research, she also examines how post-disaster recovery planning processes shape both recovery outcomes and resilience in the face of future disasters for different groups. Hamideh teaches courses in disaster resilience, sustainable communities, and planning analytical methods.*



## Understanding the Unprecedented: Social Vulnerability, Infrastructure Failure, and Catastrophe

*The Hugh L. Carey Tunnel (formerly known as the Brooklyn Battery Tunnel) sits flooded following Superstorm Sandy. ©Patrick Cashin, Metropolitan Transportation Authority, 2012.*

September 18, 2017

By Marccus Hendricks

Changing climate and growing infrastructure demands have led to already socially vulnerable populations experiencing a more threatening hazardscape. While climate change is not the singular cause of catastrophe, it is widening the expanse of social vulnerability to disasters. For example, recent work in the Clear Creek watershed on the Texas Coast demonstrated that upwards of 40 percent of flood claims between 1999 to 2009 came from outside of the currently configured floodplain. This creates questions about who in addition to the previously vulnerable are at risk to disaster and demonstrates that, in an era of changing climate, the process of tracing pathways to exposure is more complicated.

Further exacerbating this challenge is the fact that our nation does not currently have a robust inventory of the stormwater systems that are designed to help with flood mitigation. Even in cases where we do know what exists, the condition, current status, and capacity of those systems can be unknown or obsolete, particularly in disadvantaged areas. Indeed, the most environmentally unsound and physically vulnerable places are usually occupied by the most socially vulnerable populations. Thus while exposure is increasing for all, it is increasing even more so for marginalized groups.

### Social Vulnerability to Disasters

Social vulnerability illuminates the insidious ways in which some groups are disadvantaged in their ability to resist, adapt to, respond to, and recover from natural hazards. The complex nature of recent events in Houston, Texas, and the broader Gulf Coast region encourages us to take a step back and reevaluate the context of the devastation. The intersection of global climate change, infrastructure crisis, and local urban development heighten the stakes for people already living at the social, economic, and political margins of society. Disaster scholars have long demonstrated that low-income people and racial minorities are the most likely to live in low-lying areas and in lower-quality housing, placing them at continual threat of flooding. This dynamic illustrates the intersection of social and physical vulnerability to disaster.



*A blighted home in the Ninth Ward, a predominantly African-American neighborhood, remains unrepaired five years after Hurricanes Katrina and Rita devastated New Orleans. While many nearby areas have recovered to 90 percent of their pre-storm populations, only about 37 percent of households have returned to the Ninth Ward. ©The Shared Experience, 2010.*

## Social Vulnerability and Physical Infrastructure

Just as vulnerability is not evenly distributed through the hazardscape, infrastructure robustness is not equal across communities. My recent research shows that racial neighborhood composition is a strong predictor of the stormwater infrastructure available. In comparison to predominantly white communities, black, Latino, and low-income neighborhoods have a disproportionate number of infrastructure systems that have outdated development codes, are not maintained, are less efficient in rerouting high peak flows during flash floods, and cost more to repair following a disaster. In short, these neighborhoods often receive lower levels of service from existing infrastructure, which puts them at greater risk in similar hazard conditions.

Moreover, when these systems don't operate properly, water can be redirected to other areas and create residual flooding in places that are already inundated. These areas might also have outdated infrastructure and could be subject to residual flooding, localized flooding, and potential overflow of the nearby bayous. All this compounds the impacts to affected populations and complicates response.

## Unprecedented Events in the Era of Climate Change

A word often paired with Hurricane Harvey is "unprecedented." It is true that this disaster has introduced new levels of uncertainty, particularly as related to the intensity of rainfall, floodplain boundaries, storm surge from sea-level rise, and the condition of stormwater infrastructure. In this era of the abnormal becoming the new normal; of the unprecedented setting some kind of new precedent; research on these complex issues matters more than ever.

We are at a point in science, practice, and policy where we have to be proactive in hazard mitigation and critically explore the intersection of climate change, infrastructure, vulnerability, and catastrophe. It is also imperative that we move past discussing social vulnerability as a demographic variable and begin addressing the root causes of vulnerability. Social vulnerability to disaster is a function of everyday inequalities that are built into planning policy, practice, and implementation. From hazard exposure to disaster recovery, these disparities will inevitably have consequences for already marginalized groups.

### About the Author



*Marccus Hendricks is an urban studies and planning assistant professor at the University of Maryland. His dissertation investigated the inventory, condition, and distribution of critical infrastructure using the frameworks of equity, environmental justice, and social vulnerability to assess disparities in infrastructure provision across neighborhoods in Houston, Texas.*





## Vacant Spaces, Missing Faces: Reinvigorating Damaged City Centers

*A temporary public park is located at the site of a demolished building in the Christchurch Central Business District two years after a 6.3 magnitude earthquake struck New Zealand. ©Graham Tobin, 2013.*

October 26, 2017

By Nicole Hutton

Even after utilities are restored and streets cleared, the long rebuilding process reduces public use of damaged business districts. Residents encountering piles of debris and rubble in places where they typically conducted business or gathered socially may avoid the downtown. Using vacant spaces in artistic and commemorative ways can help bring people back to the city center after a disaster. Many of these efforts will be temporary, some will be transitional, and others might find a permanent home.

### The Opportunity

The heightened sense of solidarity that emerges after a disaster leaves nonprofit organizations poised to convert deserted sites into spaces for reflection and community building during early and mid-term recovery stages. Research from the 2011 earthquake sequence in Christchurch, New Zealand, found that several nonprofit organizations emerged to better connect the public with the rebuilding process. These community-focused groups temporarily turned demolition sites into seating areas, gardens, and art installations, thereby reframing reconstruction as interactive. Encountering these structures and reuniting with other community members in these spaces encouraged people to return to the downtown.

Revitalized areas can lead to sports matches beneath structures made of plastic bottles; family outings in mazes of hanging tubes; poetry readings under temporary wooden archways, and festivals against a backdrop of suspended traffic cones. Select spaces may also be reserved to memorialize losses from the disaster. For instance, one effort involved placing empty chairs to recognize each life lost. Another offered a transitional place of worship. These reimagined spaces not only commemorate the shared recent history, but also regenerate personal networks and commerce.

As these installations move from one demolished building site to the next, people's comfort with the changing landscape expands and resilience builds throughout the city. Successful efforts to facilitate interactions with the built environment from Christchurch have already been exported to facilitate recovery after the Tohoku Earthquake in Japan and Superstorm Sandy in the United States, as well as incorporated into the 100 Resilient Cities initiative.

### The Process

The ability to provide input to emergency management officials about recovery decisions allows nonprofit organizations to advocate for policies that facilitate efforts, such as reducing land-use restrictions so temporary installations and gathering places are allowed. Since many organizations involved in transitional use of space emerge after a disaster, they might need to rely on the personal connections of staff and board members to connect them with local officials and nonprofit partners in order to integrate with the formal recovery process. Consequently, nonprofit representation can be delayed or insufficient. Deregulation, however, can be negotiated through their local connections in the interim.



*Volunteers from a faith-based nonprofit clear debris from the Florida Keys after Hurricane Irma.  
©Denny Orellana, 2017.*

After receiving access to use a space temporarily, nonprofit organizations can drive community building by organizing residents to clear debris, install structures, or host events that represent their ongoing concerns and desires for the future of the city, which could range from the need for park benches and community gardens to spaces filled with metal drums for public performances. By actively participating in projects, communities revitalize both the demolition sites and their connections to the place.

## The Challenge

What we can learn from Christchurch is that, through creative uses of vacant spaces, social interaction in central business districts can be regenerated during rebuilding. Empowering nonprofit organizations to organize citizens and change rebuilding from a traditional top-down process to one that is collaborative will intersperse art, music, and greenery in areas with significant building damage. These strategies could be used now to connect communities in cities facing a long recoveries, such as Houston, Mexico City, and San Juan. Time will tell to what extent each city is ready to overcome legal and structural barriers to streamlining participation in recovery, improving community resilience, and strengthening economic outcomes in their downtown areas.

## About the Author



*Nicole Hutton is an assistant professor of geography in the Department of Political Science and Geography at Old Dominion University. Her dissertation examined resilience building strategies of interagency connections in Christchurch, New Zealand, following the 2010 earthquake sequence. She currently researches recurrent flooding and hurricane mitigation in the United States.*



## Reducing Mental Health Barriers to Preparedness: Lessons from Haiti and Nepal

*Participants create a community resources and vulnerabilities map during the three-day mental health integrated disaster preparedness intervention in Nepal. ©Courtney Welton-Mitchell and Leah James, 2013.*

June 4, 2018

By Leah James and Courtney Welton-Mitchell

Mental health can be an important factor in solving the puzzle of why people don't prepare for disasters. Whether one is struggling with depression, anxiety, or trauma-related symptoms stemming from past disasters, a person's mental state can determine how they engage—or don't engage—in preparedness activities. Our work in Haiti and Nepal clarifies the relationship between mental health and preparedness, while testing an innovative approach to increasing preparedness and improving well-being.

In recent years, Haiti and Nepal have been devastated by a series of major disasters that are exacerbated by ongoing economic and political instability. Despite exposure to predictable annual flooding and catastrophic earthquakes, we observed that many people do not take steps to prepare for future disasters. Indeed, although we observed occasional examples of innovative local approaches to disaster risk reduction, individuals and communities often failed to engage in even low-cost or free forms of preparedness, such as teaching children how to evacuate or protecting valuable documents from floodwaters.

This behavior is not unique to these contexts—studies have shown that households are generally underprepared for natural hazards worldwide. Researchers have pointed to various reasons for limited engagement in risk reduction, including psychological factors. Mental health difficulties are common in communities that face chronic disaster exposure and other hardships. In light of this, we decided to further explore connections between mental health and preparedness activities.

### Linking Disaster Preparedness and Mental Health

In 2012 and 2013, we worked with local partner organizations, Soulaje Lespri Moun in Haiti and Transcultural Psychosocial Organization Nepal, to collect pilot data that explored relationships between preparedness and mental health. We learned that those who reported higher levels of distress were less likely to prepare for disasters when compared to others in the same communities. These findings are consistent with research in the United States that indicates those with mental health symptoms may be less likely to engage in preparedness.

There are many reasons why mental health symptoms could interfere with preparedness. Explanations range from depression-related lack of motivation to avoidance of disaster and preparedness-related thoughts stemming from symptoms of post-traumatic stress disorder. Some anxiety-prone individuals could be reticent to even discuss preparedness, let alone to take recommended protective actions.

The good news is that there is hope for those suffering from mental distress. Learning coping and self-soothing strategies can help these individuals to positively engage with stressful disaster-related content. Likewise, for people that see potential disasters as a major source of stress, preparedness training can heighten preparedness-related efficacy and perceived safety, thus improving well-being. It follows that addressing mental health and preparedness simultaneously, with a single intervention, could benefit both well-being and preparedness-related outcomes. Despite what some may see as the obvious links, standard disaster preparedness curricula rarely incorporate mental health components.



*The project site in metropolitan Port-au-Prince, Haiti, after heavy rains and flooding. ©Leah James and Courtney Welton-Mitchell, 2013.*



## Design and Cultural Adaptation of an Intervention

With these possibilities in mind, we and our partners developed and implemented a Mental Health Integrated Disaster Preparedness (MHIDP) three-day intervention (see link below). This community-based workshop model is aimed at improving preparedness, mental health, and social cohesion. It emphasizes small group discussions that allow community members to talk about topics such as local idioms of distress, beliefs about the causes of mental health symptoms and related stigma, local disaster preparedness strategies and barriers, and links between mental health, culture, and disaster risk reduction. Participants develop household emergency plans that give family members specific roles in preparedness, and engage in a mapping exercise that identifies disaster-related resources and vulnerabilities in the community. Games, songs, and other experiential components teach and enhance coping skills, such as breathing and relaxation techniques. A peer-support framework creates opportunities for participants to provide and receive social support and encourages collective approaches to preparedness.

To ensure fit and acceptance in both locations, we adhered to best practice guidelines for cultural adaptation of interventions. In both Haiti and Nepal, local staff facilitated the intervention and played key roles in model development and adaptation. In Haiti, the curriculum stemmed from an earlier intervention that incorporated input from Haitian team members who drew on personal experiences as survivors of the 2010 earthquake. Elements of this initial framework, including coping mechanisms drawing on Haitian stories, songs, dance, and humor, and discussion about culturally-specific belief systems, were integrated into the current model.

Subsequently, the Haiti-specific intervention was revised and adapted by Nepalese team members, including members of the local communities targeted for programming. During these meetings, team members contributed content such as culturally-specific stories about disaster preparedness incorporating karma and other local belief systems.

## Results Indicate that Mental Health Integrated Disaster Preparedness is Effective

MHIDP has now been tested across three studies (1,200 persons in total). Randomized controlled trials were conducted with three flood-affected communities in Western Nepal and three flood and earthquake-affected communities in Port-au-Prince, Haiti. In addition, a matched cluster comparison was conducted with two earthquake-affected communities in Nepal.

MHIDP was effective in increasing disaster preparedness in all three studies, in both Haiti and Nepal. Specifically, intervention participants were more likely to engage in activities such as making a disaster supply kit (including storage of extra food and water); putting important documents in a safe place; securing dwellings; modifying furniture (securing or raising); and discussing family evacuation plans. The intervention was also effective in increasing social cohesion across all studies, and in decreasing mental health symptoms (in two of the three studies). Moreover, mediation models provided some initial support for the underlying theoretical model, revealing that intervention-related improvements in mental health partially explain improvements in preparedness (in one study), and that, likewise, improved preparedness contributes to improved mental health (in two studies). Detailed intervention results will be available in forthcoming journal articles.

Given the effectiveness of this model, we suggest others integrate mental health in disaster preparedness approaches, along with a focus on cultural adaptation. MHIDP manuals are available at no cost for Haiti and Nepal (in English, Haitian Creole, and Nepali).

*Acknowledgements: Thanks to program managers John Roger Noel in Haiti and Shree Niwas Khanal in Nepal. Intervention development and associated research were made possible through two grants from ELRHA R2HC.*

## About the Authors



Leah Emily James is a research associate with the Natural Hazards Center in the Institute of Behavioral Science at the University of Colorado Boulder. In recent years, James has also served in technical mental health and research roles with organizations such as the Center for Victims of Torture, the International Medical Corps, and the International Rescue Committee. She has worked in Jordan, Ukraine, Lebanon, Iraq, Burundi, Haiti, Nepal, and elsewhere.



Courtney Welton-Mitchell is a research associate with the Natural Hazards Center in the Institute of Behavioral Science at the University of Colorado Boulder. She is the cofounder and director of the Humanitarian Assistance Applied Research Group at the Josef Korbel School of International Studies at the University of Denver. Her research and consultancy work focuses on global mental health and gender-based violence with an emphasis on forced migration.



## Miss Katrina is Not Finished with Me: Acknowledging the Explanatory Overreach of Recovery

*A pre-hurricane headline survived in a vending machine that floated to higher ground. ©Steve Kroll-Smith, 2005.*

October 16, 2017

By Steve Kroll-Smith, Pamela Jenkins, and Vern Baxter

Hurricanes Harvey, Irma, Jose, and Maria smashed records for rainfall, wind speed, storm diameter, and more. Given all the devastation wrought, we will surely continue to hear a good deal in the weeks and months to come about recovery. This is how it typically goes, as the word disaster almost always conjures up the word recovery. Its past tense—recovered—is, after all, disaster's coda. The prefix *re-* signals a going back, as in return or revert. To become, in short, as we were before.

The word itself, has about it the scent of a final vocabulary. In 1848, John Stuart Mill wrote a joyful ode to recovery:

...what has so often excited wonder, the great rapidity with which countries recover from a state of devastation; the disappearance, in a short time, of all traces of the mischiefs done by earthquakes, floods, hurricanes, and the ravages of war... a few years after, everything is much as it was before.

Mill focuses on infrastructure recovery, as does the recent New York Times piece on Harvey. But restoring a power grid or rebuilding a house is not the same as refashioning a sense of self; a more or less coherent idea about who and what I am as a survivor of catastrophe.

In the wake of Hurricane Harvey, New York Times Reporter Benedict Carey visited New Orleans to interview a few people, now in their 20s, who lived through Hurricane Katrina. Each person he spoke to conveyed a struggle to find something or someone to hang on to as the years went by; an anchor, a shelter from a storm inside them that will not abate. Each returned to New Orleans, not to home as they knew it, but, in Carey's telling, "to a permutation of it, one with an existential uncertainty that is no abstraction."

We too found this "existential uncertainty" in our interviews with Katrina survivors. Four years after the storm, we spoke to Jesse Gray, a life-long resident of New Orleans. He and his wife Denise were once again living in Hollygrove, a modest neighborhood in the heart of the city. Their house rehabbed, we sat looking out on their trimmed yard and asked Jesse how he was doing. Gazing up, as if talking to the ceiling, he told us: "About a year ago I started having nightmares. I couldn't get rid of my nightmares. I'd wake up at night soaking wet... I've been trying to wake up right, but you can't wake up right."

A year later, we spoke with Jesse again. It had now been close to five years since Katrina swamped the city. Jesse's nightmares had continued, but now they were filled with shadows of a tragedy no parent should endure. In May of 2010, Jesse's son was murdered; the victim of a neighborhood robbery.



*In Pontchartrain Park, a flood-stained communion dress is salvaged from the wreckage of Hurricane Katrina. ©Pamela Jenkins, 2005.*

"Since Katrina and then my son got killed, I've been taking time to see a psychiatrist once a month," he recounted. "I go to a PTSD group twice a month. I sing in the choir on weekends." We watched and listened over the years as Jesse weathered the mayhem of an historic flood only to face a parent's true nightmare. How much of the variance in Jesse's experience is explained by the word recovery?

Jolinda, another participant in our study, lived in Pontchartrain Park when the city flooded. She evacuated. She returned and restored her flooded house. Five years later, in 2010, she found herself sitting in church connecting to what she said matters most in her life, her relationship with God. But Jolinda could not help noticing "a pain on my left side. And I felt dizzy. I began to perspire." She left church and called 911. "An ambulance picked me up." Jolinda paused at this point in the interview, took a breath, and noted methodically, "Miss Katrina is not finished with me."

In her turn of phrase, Jolinda reminds us of the overreach of this ubiquitous word recovery. Years after a catastrophe enters the history books, it continues, in its morphing ways—perchance blending with other losses—to bend and shape lives.

Jesse, Jolinda, and the many other people we spoke with years after the city flooded forced us to acknowledge the often unbridgeable gap between their misery and our analytic vernacular. As we think about how best to deploy our research skills and collective wisdom to make some viable sense of the miseries in the wake of these storms of 2017, perhaps some of us will look for words that reach beyond the finality of recovery to offer something that better captures the complex ways disasters continue to reverberate through people's lives. For the many people who talked with us years after the flood, Katrina is not something they lived through, but rather, something they live with. A lesson worth remembering.

## About the Authors



*Steve Kroll-Smith is a professor of sociology at the University of North Carolina at Greensboro. His most recent book, *Recovering Inequality: Hurricane Katrina, the San Francisco Earthquake of 1906, and the Aftermath of Disaster*, will be published as a volume in "The Katrina Bookshelf" by the University of Texas Press in Spring 2018.*



*Pamela Jenkins is a research professor emerita of sociology and women's studies at the University of New Orleans. Her research interests include issues of disaster recovery and coastal sustainability.*



*Vern Baxter is professor emeritus in the Department of Sociology at the University of New Orleans. His current research is focused on race and finance in antebellum New Orleans.*



# Children, Distress, and Disaster: How Adults Can Help

September 9, 2017

By Betty Lai and Ann-Margaret Esnard

Hurricane Harvey highlights how quickly disasters can devastate whole communities. Children are a group worthy of special attention because experiences of trauma and loss may be especially difficult for young survivors. Many young people have traumatic experiences during childhood. In the United States alone, a representative study of children aged 2 to 17 years found that 14 percent reported having been exposed to a disaster. During and after disasters, children may experience scary events, such as needing to be evacuated from a flooded area. They may lose their possessions, and they may not be able to return to their homes.

Social and behavioral scientists have firmly connected disaster exposure with clinically significant distress in children. This distress can include post-traumatic stress symptoms, depression, or anxiety. Post-traumatic stress symptoms could be flashbacks to the event, feeling upset or afraid at reminders of the event, avoiding interacting with friends, or having trouble with sleep. Depression could include experiencing intense sadness, crying, having difficulty engaging in school work, or feeling that nothing is fun or meaningful. Anxiety might include excessive worry, feeling afraid of many things, feeling sick to one's stomach, or worrying about future events.

## Do All Disaster Exposed Children Report Distress?

Disasters are disruptive by their very nature. But the good news is that many children are psychologically resilient after disasters. We recently reviewed eight studies of children's responses to disasters. Across those studies, between 37 to 79 percent of children were resilient and reported very few negative mental health symptoms. However, a portion of children across the studies reported severe distress that did not go away over time (between 4 to 38 percent across the studies). These severe distress symptoms can last a long time, sometimes stretching for two years beyond the disaster.

Children at highest risk for experiencing severe, chronic distress include those with histories that make them vulnerable. That could involve experiencing a past disaster, living in a violent community, or having a history of anxiety. The most vulnerable children are also those who experience multiple stressors during and after the disaster, such as having to be evacuated, witnessing destruction, or having to move multiple times. However, stressors that are not directly related to the disaster, such as a parent losing their job, matter as well. Research also shows that children who have severe distress initially after a disaster are more likely to report severe distress over time. As researchers, we are working to integrate findings across disasters so that we can be better prepared to quickly identify the most vulnerable children in future disasters.



*A Louisiana National Guard soldier evacuates a child from flooding caused by Hurricane Isaac. ©Sgt. Rashawn Price, U.S. Army, 2012.*

## How Can Parents and Teachers Help Children Be More Resilient Disasters?

In light of the body of research regarding children's trauma and distress, it is important to focus on what can be done to assist young people after disaster.

- **Provide information, but make sure it is appropriate for your child's age.** Withholding information about a disaster is scary for children. Children may start to think you are keeping secrets and that things are even worse than they appear.
- **Limit media exposure.** Exposure to graphic images in the media is linked to distress in children. Limit news exposure of the event so that you are able to monitor the images and information children see.
- **Ask your child how they are doing.** Do not assume that they feel the same way you do. Children's reactions do not necessarily match their parents' reactions.
- **Routines are important.** Get children back into their routines as soon as possible. This helps children feel like life is returning to normal. Examples of this include returning to schools when they reopen or returning to a bed time routine.
- **Stay connected.** Feeling connected to friends and family helps children become more resilient after a disaster. Find ways to help children stay in touch, especially if you have moved to a new location.
- **Practice and model coping skills.** Show kids many different positive ways to handle stress. Talk to them about what you are doing, and give them opportunities to practice coping skills. For example, "I am feeling really stressed right now about the insurance paperwork. I am going to get a cup of tea. I can come back to this in a little while. Would you like to have a cup of tea with me?"
- **Seek help.** Disasters are stressful events for everyone, particularly those who have had to evacuate or who are displaced and in limbo. Seek help for yourself or your child if the stress is interfering with your life.

### About the Authors



*Betty Lai is an assistant professor in the School of Public Health at Georgia State University. Her work focuses on children's responses to disasters. Her research has been funded by the National Science Foundation and the National Institute of Mental Health. More information about her research may be found at her lab website.*



*Ann-Margaret Esnard is the interim associate dean for research and strategic initiatives in the Andrew Young School of Policy Studies at Georgia State University. Her National Science Foundation-funded projects include studies on population displacement from catastrophic disasters and school recovery after disasters. She is the co-editor of the book *Coming Home after Disaster: Multiple Dimensions of Housing Recovery*.*



## Smart Recovery: Mapping, Mitigation, and the Long Rebuilding Process

September 8, 2017

By Michael Lindell

This past week's television coverage has shown dramatic search and rescue activities as flooding from Hurricane Harvey struck Houston. Residents and elected officials alike have commented on the spirit of cooperation among Texans who have been united by the common goal of saving lives. As heartwarming and meaningful as the stories of emergency response are, the real challenges of the response to Hurricane Harvey will be the same as other major disasters. After the network cameras are gone, the real story will unfold during the years of efforts to recover from the disaster.

*Nearly a year and a half after Superstorm Sandy struck the East Coast, neighborhoods along Route 35 in New Jersey were still in the process of reconstruction. © George Pankewytch, 2014.*

One major task will be to rebuild or replace flooded homes; an estimated 30,000 to 40,000 in the city of Houston alone. Construction on this scale will be slowed by a shortage of capacity by local construction companies—requiring additional contractors from outside the area. The best of these companies will be hard pressed to recruit and house all of the qualified workers they need. The worst of them will place a higher priority on profits than on the quality and timeliness of their work or of the protection of their workers.

The speed of recovery will also be limited by homeowner ability to pay for necessary repairs. If they did not know it before the storm, they will find out now that their standard homeowner insurance policy does not pay for flood damage. Indeed, less than 20 percent of Houston's flood damaged residential structures are covered by flood insurance. As a result, the overwhelming majority of homeowners will need to rely on individual assistance grants and Small Business Administration (SBA) loans. An individual assistance grant is typically around \$5,000 and an SBA loan is essentially just an additional mortgage that needs to be repaid, although at a lower interest rate than a commercial loan. This will increase the financial burden on already cash-strapped households.

In the long run, the greatest challenge will be to rebuild smart, as well as quickly. Smart recovery means integrating hazard mitigation into the reconstruction process. That is, flood maps will need to be updated to account for the increased runoff from upstream development. Smart recovery also means adopting land use practices, like converting the most highly flood-prone areas to open spaces such as riverside parks and playfields. It also includes adopting building construction practices such as elevating structures above the base flood level. For example, cities could encourage developers to construct commercial and multifamily residential structures that have parking on the (floodable) ground level. Flood resilience can be further improved by incorporating flood-proofing measures such as waterproofed walls and removable shields around doors and windows.

This strategy of adopting flood mitigation practices that recognize the specific level of hazard exposure in each area is well known to emergency managers and land use planners. It is often resisted, however, by local stakeholders who attempt to minimize short-term construction costs regardless of the long-term consequences to the homeowner. These proponents of the status quo frame the housing recovery problem as a false choice; the only alternative to abandoning the region altogether is to rebuild new structures that are just as vulnerable as the ones that were destroyed. Unfortunately, these local stakeholders have an outsized influence on local land use and building construction practices.

The challenge ahead for emergency managers and land use planners will be to mobilize local coalitions that advocate for better flood hazard mapping and mitigation in their communities. Their reward for successfully increasing their communities' hazard resilience will be significant reductions in disaster deaths, property losses, and social disruption.

### About the Author



*Michael Lindell is professor emeritus from Texas A&M University and an affiliate professor at the University of Washington and Boise State University. He has more than 40 years of experience in the field of emergency management. Among many other publications, he is the author of two textbooks—Introduction to Emergency Management and Emergency Planning.*









## Managerial Perspectives on the Role of Public Libraries in Disaster Response

*Children cut the ribbon on the reopening of the historic Cita Hubbell Library in New Orleans. Libraries can play a supportive role in community response and recovery from disasters. ©FEMA, 2013.*

January 4, 2018

By Michal Linder

Recent natural disasters have prompted numerous local public service organizations—such as public libraries—to set aside routine activities and assume crisis-related roles to meet the needs of the community. Such entities do not focus on disaster management in their daily operations; yet they have deep understanding of local contexts and diverse expertise. Although these organizations often rise to the challenge of responding to disasters, their efforts have not always been recognized, and their capacities have not been systematically harnessed. For instance, in a study of libraries' response to tornadoes in different communities across several Midwestern states, a local fire chief confessed that he had no idea that a library was involved in response and recovery efforts. A former Federal Emergency Management Agency director stated that FEMA did not have public libraries on the radar as a potential resource in disaster response.

It is challenging to predict disaster-related responses of groups and organizations that do not routinely deal with emergency activities. Managers of these organizations have different perceptions and assumptions about their roles and capacity to assist in disaster situations as well as the appropriate forms their reactions might assume. However, to create disaster response plans that take greater advantage of the resources and capabilities of local organizations and civil society, there is a need to anticipate potential decisions and actions of these organizations and the extent to which their managers would be willing to address community needs during such events. This in turn could provide insight into ways to mobilize and incorporate potential disaster-related efforts systematically into a broader whole community response.

To advance knowledge in this area of study, I interviewed public library managers and directors in Hampton Roads, Virginia, and found that although most officials agreed that libraries should generally play a supportive role in disasters, they differed on the extent to which they believed libraries should be formally involved in planning and response. For many, the dynamics of change such as deviating from conventional roles while managing established routines seemed complex. Specifically, they perceived a conflict between seeking creativity and trying something new and capitalizing on familiar expertise. Accordingly, respondent narratives reflected both rigid and adaptable components and included both more defensive and more proactive characteristics. The differences in interpretation can be explained by library officials' immediate policy environment, combined with how they identified with their public service role.



*The Rosa F. Keller Library was restored using FEMA funds after Hurricane Katrina. ©FEMA, 2012.*

### The Proactive Manager

Proactive library managers believe libraries should play a greater role in disasters. These managers do not always adhere to formal rules and procedures when making disaster-related decisions, but rather remain open to new possibilities. This can mean deploying the organization's assets, at least temporarily, as if it were a first responder agency (e.g., providing

space for medical care and shelter or organizing donation distribution operations). Public service for these managers entails adapting to changes and promoting and advocating for an awareness of library resources rather than maintaining traditional roles. Proactive managers are also fully engaged and find meaning in their managerial role. Having an entrepreneurial spirit, managers do not necessarily think of the organizational mission as narrowly defined. Instead, they might use their imaginations to think of ways to reposition the library and adapt to new demands. For example, one library director professed:

I think if I don't do that [become proactive] people will not think of the library as a resource. They'll just forget about the library and see the library as a warehouse of books and say, 'wow, I didn't know you had a meeting room with audio visual material, or you had this space that you could move people to if you needed to. Or you have vehicles available that could assist us with X or Y.'

Another librarian from that region went further and argued:

Libraries are flexible, because we are flexible, we can mold the library to fit the need—whatever that need might be. If we need to be a shelter, if we need to have extended hours or if we need to be a place for people to have community meetings.

This reflects an orientation to thinking and acting in less conventional ways when necessary and becoming more creative, innovative and available to the community in different capacities. Proactive managers understand the added value their libraries can provide in planning for emergency response and the importance of taking part in the planning process. They call for greater inclusion and seek to be "part of the team" and "at the table" for emergency planning. A library director argued:

I would rather be in the loop than out of the loop. I would rather be part of the solution than sit back and wait to be told what we could do. I'd rather be at the table for planning during the event and recovery phase so I can say 'Hey, we can do that!'

These managers see the positive outcomes generated from being included in disaster-related decisions. The sense of recognition and legitimacy for their actions is associated with their expressed willingness to be fully engaged in collaborative efforts.

## The Defensive Manager

Contrary to the proactive managers, defensive library managers are hesitant about libraries playing a role in community-based disaster response, claiming that libraries lack the necessary expertise and are short on resources. Public service for the defensive manager involves maintaining and protecting the long-term institutional identity of the public library rather than changing and transforming it. Accordingly, for them, a clear public duty is not to respond to new demands or search for innovation but rather to resist any library misuse. One manager from a regional library stated:

I see the library as doing more of what we always do. I don't necessarily see libraries as a place that would shelter people. A building isn't built for that. We don't have showers, we don't have kitchens, we're very different from a place that would be used as a shelter. I don't know that that's a role we would play.

Indeed, members of organizations are more motivated to act on issues they believe will damage the organizational image, as their individual identity is tied to this image. Consequently, anything that is perceived as a risk to their organization and its image is considered a threat and triggers resistance. Control and stability are therefore key characteristics for the defensive manager and other organizations would probably have greater roles in emergency response.

## Moving Forward

Local public service organizations such as libraries can play a greater role in local emergency networks. Management matters, however, and predicting which organization will be part of the network involves understanding managers' perspectives. Do such officials have enough resources or autonomy to assume a new role? Do they identify (and agree) with this role? Do they view their organization as potentially performing this role? Managers may adjust differently to changes and uncertainty. While some may be more open to less-conventional directions others may be reluctant to assume a new role. Promoting a more proactive approach to disaster response involves recognizing these organizations and their managers ahead of time and inviting them to participate in disaster-related planning and decisions. Public officials should therefore guide local emergency authorities to identify variety of opportunities that local public service organizations such as public libraries can assist during disasters.

## About the Author



*Michal Linder is an adjunct faculty at the School of Public and International Affairs at Virginia Tech. Her research focuses on inter/intra-organizational behavior before, during, and after crises and disasters, with an emphasis on the range of individual, groups, and community organizations' responses to large-scale emergencies.*





## Together We Stand: The Vital Role of Social Networks among Displaced Low-Income Women

*Destruction from Hurricane Katrina nine months after the event. The devastation of entire neighborhoods forced many people to relocate for long periods of time, removing them from the support of family and freindship networks. ©Thomas Hawk, 2006.*

September 28, 2017

By Jacquelyn Litt

The wrath of Hurricanes Harvey, Irma, and Maria and subsequent population displacement raise vital questions about resettlement and recovery. Lessons learned from Hurricane Katrina show that policy will drive the long-term effects of these recent storms for low-income households headed by women. Indeed, post-storm recovery for the most marginalized populations will hinge largely on whether or not social networks among the poor are rebuilt. Housing, employment, and transportation infrastructure must create opportunities to restore these networks to avoid deepening inequality.

Between 2005-2009, I undertook a long-term study of the resettlement status of women and their families after Hurricane Katrina. This allowed me to document paths and practices of recovery that go well beyond demographic data about households and individuals. I was able to observe and analyze the critical role women played in managing family recovery and highlight the crucial role kinship networks played in resettlement.

My research showed that—in much the same way they organized the daily household and network operations before the storm—women head of households assumed responsibility for the post-disaster period. Their overwhelming concern was to reestablish kin networks that had dispersed after leaving shelters in New Orleans. The reason why kinship networks were vital in displacement was because the resource exchange among this network had been a key means of the network's survival. This confirms a long-standing sociological observation that low-income households depend on resource exchange to provide the goods and services they rely on. For example, elderly network members provided child care so that mothers can seek employment, food is given or shared when a household runs low, transportation is often pooled since only a few have cars; money, housing, and medicine is shared too. My post-Katrina research documented that these networks assumed an even more vital role for resource recovery during displacement, and that it was women who expanded their daily network responsibilities to face the new challenges in the post-disaster period.

The separation of networks created a danger to short- and long-term survival. All 60 of the evacuees who participated in my study spent their entire lives in New Orleans, and most had families that were rooted there for generations. All recalled living near each other; being in and out of each other's houses; and sharing meals, money, housing, job information, child care, vehicles, and so on. Before Katrina, households within these networks could manage on their barely livable wages—because they were near to each other and had a well-developed system for sharing resources and services. Conversely, socially isolated households with none of the same network capacity, struggled with the depths of poverty.



*A cleanup volunteer holds a picture found in the rubble of a home after Hurricane Katrina. Family networks are vital in helping rebuild after disaster. ©Brian Wolfe, 2006.*

I directly observed the consequences of variability on a network's capacity to rebuild. In my project, some families eventually moved to Houston, while others returned to New Orleans. Among those who moved to Houston, a large part of the kinship network reconvened, partially because the housing authority where one of the aunts (who took in dozens of people initially) was able to find apartments for the extended family in the same facility. Combined with the availability of jobs and public transportation, this network returned to the sharing of resources and a state of stability that has continued over time. In New Orleans, by contrast, the remaining housing stock was both too expensive and too dispersed to allow the pre-existing network to reunite. Public housing units were torn down, eliminating opportunities for network consolidation. Households often moved often, as rents increased dramatically, or transportation was poor, or jobs were unavailable close by, or neighborhood crime and other dangers increased to intolerable levels. Households in this context became isolated units—radically unlike their pre-Katrina lives—and were spread throughout the city with little access to the network exchange they had previously relied upon. In this situation, where network unification was virtually impossible, households lacked the basic necessities for survival. Respondents pleaded for food when I would come to visit. They were living in fear and with no hope—a poverty level that could have been avoided if accommodations had been made that allowed previous networks to gather again with stable housing.

As the recovery unfolds from the most recent hurricanes, we can use these findings to carefully plan resettlement. The research calls for conscious attention to the voices of women head of households and pre-existing housing maps. It also calls for funds to allow households to reunite with their kin networks. These can help recreate the network infrastructures that can prevent the devastating downward spiral I witnessed in New Orleans. Stable housing, employment, and transportation must be made available in sites where networks are resettled, because it is in this context that we can be assured that the poorest of the poor, hit hardest by Harvey and Irma, and Maria, can re-establish their strategies for daily survival.

### About the Author



*Jacquelyn Litt is dean of Douglass Residential College and the Douglass Campus, and is a professor of sociology and women's and gender studies at Rutgers University-New Brunswick. Litt received her PhD in sociology from the University of Pennsylvania. Her research specializes in motherhood, race, and poverty, and she is an award-winning author of two books and numerous articles.*



## Beware of Recovering the Worst Parts: Race, Class, and Gender Guidelines for a Just Recovery

*Guatemalan women attend a school festival hosted by a humanitarian organization. Although women's voices are vital to recovery, their role as caregivers are often seen as reason to disqualify them from community efforts. ©Erik Törner, 2009.*

October 11, 2017

By Rachel Luft

While politicians and the media often describe disasters as blank slates for new development, disaster scholars—and many disaster survivors—know that post-disaster recovery is usually built on pre-disaster social scripts, power dynamics, and resource distributions. Well-meaning recovery efforts, whether public, private, or grassroots, can also reproduce or even deepen preexisting inequalities. Interrupting this pattern requires better understanding the processes that perpetuate injustice. When Hurricane Katrina struck New Orleans, human-made canals sent water surging into neighborhoods. Similarly, years of pre-disaster organizational structures, habits, relationships, and values carve invisible social pathways along which post-disaster decisions, funding allocations, and leadership are carried. Ironically, the very sense of urgency that characterizes recovering communities makes it seem like performing an inventory of these taken-for-granted processes is a luxury. Without it, however, post-disaster methods often recover the worst of a community's injustices right inside the shiny new schools and freshly painted homes.

### Race, Class, and Gender Intersectionality

The most recent generation of disaster scholarship and advocacy demonstrates that some of the most important preexisting conditions that inform recovery are race, class, and gender. Without attending to race *and* class *and* gender *and* their intersectional interaction, even the best recovery efforts are likely to regenerate inequalities. Doing recovery differently means: 1) having a clear sense of how race, class, and gender are already embedded in our recovery practices; 2) performing ongoing racial, economic, and gendered audits of our recovery activity; 3) and trading in some of the expediency that characterizes recovery efforts for a commitment to performing them more justly.

The reproduction of race, class, and gender inequality happens at every level of recovery decision making: federal, state, local, and community; and public, private, non-profit, grassroots. I'll use the lowest level—community-based recovery efforts—from Hurricane Katrina as an example, because it is the level that people often feel the most agency, and the powerful structures that influence their behavior can be the most invisible and informal.



*A pastor oversees operations at a shelter for people evacuating from Hurricane Katrina. While Katrina recovery efforts often had a strong racial justice element, gender wasn't as well considered. ©John Whelan, 2005.*



## Organizing for a Just Recovery After Hurricane Katrina: Intersectional Lessons

In the days and years after Hurricane Katrina, many community-based social justice organizers drew on racial and economic justice principles—and centered the voices of low-income people of color—as they sought to influence recovery policies. This commitment did not happen spontaneously. It was the fruit of years of highly intentional racial justice organizing in the majority-black city of New Orleans. It was also made possible by well-developed racial justice principles in social movement networks across the country. Here we see the doctrine at work in a positive way: post-disaster racial justice activity was built on firm pre-disaster antiracist foundations.

Unfortunately, feminist analyses were not as strong. This meant that in the rush to recovery advocacy, activists often reproduced gender inequalities. For example: men disproportionately appointed themselves to leadership and decisionmaking positions, describing women's caregiving obligations (expanded and complicated by disaster) as disqualifying; perpetrated sexual violence within advocacy groups; and framed strategy (about health care, housing, etc.) in gender-neutral ways despite repeated efforts by women of color to demonstrate their deeply gendered, intersectional implications.

Absent an intersectional gender analysis that checked taken-for-granted assumptions and collective habits, men wound up making decisions for the bigger, better resourced groups, demonstrating masculinist preferences for protest over hybrid models that also responded to people's survival needs. Caregiving obligations that disproportionately fell to women became reasons to cut women out of leadership and dismiss their contributions, even when they were better qualified. Additionally, without an analysis of the pervasive workings of rape culture, the cultures and structures that enable sexual violence went uninterrupted.

*Wound up, disproportionately fell to, and went uninterrupted.* Behind each of these passive verbs are myriad active choices, assumptions, agreements, and a lot of momentum.

Taken together, these now well-documented gendered practices meant women and gender non-conforming people were less likely to frame campaigns, direct resources, and have the ability to create safety for all. It meant that feminist priorities around decision-making, family wellbeing, and safety went unheeded. Because neglecting gender analysis always has intersectional consequences, this in turn meant that not only were women harmed by sexual violence perpetrated by white men, but that black men were blamed for it. It also meant that women of color—who knew the most about the intersectional impacts of disaster on people in their communities—did not have the resources to address it and that social justice advocates could not often balance grassroots organizing, recovery advocacy, and meeting the basic needs of hurricane survivors. In order to do it differently these groups would have had to embrace an intersectional race, class, and gender analysis and use it to audit their daily decisions and practices, even or especially those that seemed like common sense.

Recognizing the need to take race, class, and gender into account in every facet of recovery activity is a first step to rebuilding communities that do not re-entrench the disastrous parts of how it was before.

### About the Author



Rachel Luft is associate professor of sociology at Seattle University. Her primary areas of research are race, gender, intersectionality, and social movements, often in the context of disaster. For years following Hurricane Katrina, which struck while she was teaching at the University of New Orleans, she was a participant observer in grassroots social movement responses to the disaster.



## Nonprofit Coordination and Managing Donations: Hidden Keys to Recovery

*Children's art displayed in the West, Texas, long-term recovery organization offices. Children wrote their hopes and feelings to the city after a fertilizer plant explosion in 2013. ©Michelle Meyer, 2013.*

September 15, 2017

By Michelle Meyer

Two of the longest standing lessons of disaster are that neighbors help neighbors during disasters and that rebuilding from the devastation is a long process. How can donations and material resources be harnessed to support the most vulnerable populations long after the media focus has moved on? My National Science Foundation-funded research on long-term recovery committees provides important insights.

My colleagues from the Hazard Reduction and Recovery Center at Texas A&M University and I spoke with officials and nonprofit representatives who were leading long-term recovery teams in six communities across Texas. These communities had little in common except that they relied on nonprofit assistance and financial donations from the public to rebuild their homes and lives.

### The Importance of Donations and Nonprofit Coordination to Long-term Recovery

Many assume that the Federal Emergency Management Agency (FEMA) or private insurance cover the costs of rebuilding houses. While this is true for some individuals, we expect that in flooding from Hurricane Harvey, a majority of individuals will be uninsured or underinsured. Homeowners will apply for FEMA aid, but it has a maximum benefit of around \$35,000. The Small Business Association (SBA) provides another type of government support by issuing loans that must be repaid. Many people—especially low-income and elderly—will not qualify.

So what happens when insurance and government resources are not enough?

This is where financial donations to local nonprofits become important. Based on guidance from FEMA and the National Voluntary Organizations Active in Disaster (VOAD), community leaders will coordinate local, regional, and national nonprofits into a Long-Term Recovery Committee. These committees are designed to try to ensure that resources are not duplicated (and thus wasted) and that recovery funds go to those who need them most. Our research shows that these committees often take one of two forms:

1. A new nonprofit specifically for long-term recovery, such as the Bastrop Long-Term Recovery Team.
2. A network of nonprofits that collaborate to support long-term recovery.



*Donations collected by the University of Illinois Disaster Relief Volunteer Group after a tornado struck nearby areas. ©University of Illinois Springfield, 2007.*

Whether they chose the first or second option, these groups draw upon resources from numerous local and regional organizations to provide volunteer labor, in-kind donations, and financial support that can be channeled through a case management approach for unmet needs. To be successful with either process, building trust via transparency and openness is crucial.

Our work also demonstrates that long-term recovery leadership has to be trustworthy to garner the financial support of foundations and donors. How is trust built? Our research indicates that the following four components are key:

1. **Diversity of long-term recovery committee membership.** Include representatives from all nonprofits, city officials, faith-based groups, and representatives for the most vulnerable populations including elderly, low-income, homeless, and racial and ethnic minorities. Often the unmet needs in disaster are compounded by previous needs, especially for those living daily in poverty. Thus, the committee will need input from these groups to ensure that recovery information reaches those who most need it and that considerations are inclusive.
2. **Local leadership.** As the committee takes shape, external organizations will provide a wealth of advice about what to do and how to organize. Although these groups mean well, recovery is long and necessitates leadership that is local and will stay in the community during the rebuilding, which may take several years. Many disaster relief and recovery organizations travel from disaster to disaster taking experts and resources with them. In the past, some of local communities felt unprepared to take over recovery when disaster organizations left midway through rebuilding. As these organizations work to rebuild, we cannot emphasize enough the importance of donating money (more than things) to local nonprofits who will be rebuilding houses for one, two, or even up to 10 years or more.
3. **Participation of experts.** As long-term recovery continued to unfold, most of the committees we studied brought in experts including construction advisors, lawyers, title company advisors, bankers, accountants, case management specialists, and disaster recovery professionals. These experts played a vital role because recovery groups tackle issues across many spheres of survivors' lives, and do so while under pressure to move resources quickly. These experts helped to ensure effective and efficient use of funds in each case management decision. Their early guidance—while recovery decisions are being made—adds accountability and helps the group avoid later mistakes that cost precious money and time.
4. **Participation of survivors.** Finally, many committees have trouble deciding how to incorporate the voices of survivors. Committees may think that not including survivors is supportive by not overburdening those who are recovering with committee work. Without the voices of the affected, however, efforts can become top-down and important needs that survivors value will be overlooked. The most successful committees have committee roles specifically for survivors to check and balance their mission.

The next several years will be trying for each of the Texas and Louisiana communities badly affected by Harvey. A knowledgeable and trusting coalition of nonprofits will harness the full generosity of the public to help individuals and entire communities rebuild in ways that are more just and resilient.

## About the Author



*Michelle Meyer is an assistant professor of sociology at Louisiana State University and a former postdoctoral researcher with the Hazard Reduction and Recovery Center at Texas A&M University. Her research interests include environmental sociology and community sustainability, disaster resilience and mitigation, climate change displacement, environmental justice, and the interplay between environmental conditions and social vulnerability.*





## It's Time to Bring Back the People: Challenges and Opportunities for Participatory Disaster Recovery

*Volunteers pass out supplies such as water, clothing, food, and diapers at a community donation center in Houston following Hurricane Harvey. ©FEMA, 2017.*

October 18, 2017

By Samantha Montano and Paolo Cavaliere

Four major hurricanes have affected the southern United States and U.S. territories in the past month, throwing many communities into periods of extended disruption. After immediate life-saving needs are met, public officials almost immediately turn their attention to recovery efforts. Ideally, communities would have recovery plans in place before a disaster, but in reality communities often plan for recovery during recovery. When decisions that can have enduring consequences are made in haste, it is all the more important that public officials include public input.

Research shows that highly collaborative planning processes result in better planning outcomes. Public participation is important because it upholds democratic values, which maintain that residents have the right to express their opinions on proposed projects. Having a broad spectrum of stakeholders, planners, and managers involved in solving problems allows knowledge and different views to be incorporated.

Public officials who are considering a participatory process will benefit from the following information and recommendations, which are informed by research in this area:

### **What is the purpose and what are the objectives of the participatory process?**

Agencies should clarify the goal of the participatory recovery and the objectives should be collectively agreed upon with various stakeholders. It is important for local communities to make their own decisions about recovery priorities, how to fund recovery projects, and which mitigation strategies they may want to implement. This helps a community to feel ownership over the process and ensures that the decisions that are made reflect the values of the community.

### **Who should be involved in a participatory process?**

Communities are made up of a variety of stakeholders (i.e., residents, businesses, nonprofits, government officials) with various perspectives and priorities. These stakeholders might be interested in various aspects of the recovery process that affect them or their constituents. Public officials should consider making the participatory process representative of the entire community, paying special attention to making the process accessible for all members.

### **When is the right time for planning the participatory process?**

If public officials have not engaged in recovery planning before the disaster, they now have a chance to implement a participatory process post-disaster. Keeping in mind time constraints, administrators can arrange public meetings as soon as the emergency response has ended. This allows leaders to identify interested parties and begin to create a culture of community participation from the very start of recovery.



*A volunteer hands bottled water to a resident at a food distribution center in Lakeland, Florida.*

©Patsy Lynch, 2017.

### **What techniques can be used to encourage the participatory process?**

The various issues during recovery should be presented and discussed openly to allow residents to offer comments, question the feasibility of projects, and integrate their thoughts and preferences. Communities have found advisory committees and collaborative planning are efficient models. With the first, the public can give comments on plans, through the second, residents are given significant roles in decision making. Regardless of specific techniques, a two-way communication approach between public officials and stakeholder groups are important.

### **Avoiding some pitfalls.**

Designing a participatory process is not an easy task and there are some pitfalls public officials will want to avoid. If administrators do not have an effective communication approach, they risk not reaching all the interested parties. It is critical to clearly explain why stakeholders will be interested in the process, otherwise participatory recovery won't receive public attention.

Tapping into the collective knowledge of residents is essential. If residents feel that their knowledge is not valued, they might also avoid engaging in the process. Failure to include the public can result in conflicts after decisions are made. Finally, it is important to not wait too long to begin the participatory process or the effort risks losing credibility and the trust of constituents.

Understanding that stakeholders across the community engage in recovery efforts outside the leadership of public officials can be useful. Maintaining a working relationship between stakeholder groups can encourage collaboration, while removing bureaucratic barriers can allow community groups and businesses to quickly address recovery needs.

Overall, designing a participatory recovery process provides an opportunity for a more successful community recovery. Public officials can expand their understanding of community problems and needs by assembling a broad coalition of stakeholders. Including the public decreases the chances of facing opposition after the process is underway. It is also an opportunity to educate the public about hazards and disasters. Ultimately, the recovery process can be more effective, efficient, and equitable when public officials engage in a participatory process.

### **About the Authors**



*Samantha Montano has a PhD in emergency management from North Dakota State University. Her research focuses on emergent recovery groups, nonprofits in recovery, and disaster volunteerism.*



*Paolo Cavaliere is a PhD student in urban affairs and public policy at the University of Delaware School of Public Policy and Administration. His research interests focus on leadership in emergency management, public participation in hazard mitigation, nonprofit organizations and advocacy in recovery.*



## Speaking Truth to Power: Please Don't Call Them *Natural* Disasters

The now-closed Mississippi River Gulf Outlet (MRGO) allowed Hurricane Katrina's storm surge to travel inland, causing levee breeches and engineering failures that ultimately flooded the city of New Orleans. ©Louisiana Sea Grant College Program, 2005.

February 15, 2018

By Richard Olson

The 2017 Atlantic hurricane season has now entered the history books as the seventh most intense on record—17 named storms and 10 hurricanes (six of them major, including two Category 5 storms and three Category 4 storms that made landfall in the United States).

Hurricane Harvey's impacts in the area of Houston, Texas; Hurricane Irma's impacts on the west coast of Florida; and Hurricane Maria's impacts on Puerto Rico will be historic events for hurricane disasters in the United States. The Federal Emergency Management Agency reports that approximately 25.8 million people in the United States were affected by those three hurricanes alone, and the National Oceanic and Atmospheric Administration calculates that the storms inflicted a cost of \$265 billion. Globally, Munich Re estimates the total insured and uninsured losses from all types of disaster to be \$330 billion, with about half of those losses concentrated in the United States.

The reality is that exposures to hazards are increasing and climate change will give us more extreme weather events. We know that irrational land use policies, non-compliance with building codes, poor governance, and bad planning in general work together to put more assets and people in harm's way. Hurricane Harvey, for example, demonstrated the folly of unrestrained and unsustainable urban sprawl in a region prone to severe flooding. We will certainly continue to dissect the Harvey disaster and ask how Houston accommodated its remarkable population growth over the last several decades with an uncomfortable question: "Who was put in harm's way, to which threats, by whom, and why?"

Unfortunately, a persistent problem in public discourse is the penchant of public officials—and the media—to label major damaging events as "natural" disasters. The research community knows better, and has for a long time, from Phil O'Keefe and colleagues' 1976 *Taking the Naturalness Out of Natural Disasters* and Kenneth Hewitt's 1983 "Interpretations of Calamity from the Viewpoint of Human Ecology" to Gaillard et al. in the January 2014 *Natural Hazards Observer*, *Taking the 'naturalness' out of natural disaster (again)*. And who can forget Ben Wisner and colleagues in *At Risk: Natural Hazards, People's Vulnerability and Disasters*? They were classically blunt in stating that nature only provides events; it's social and economic structures and processes that are the root causes of our (highly unequal) vulnerabilities.



A tattered landscape in Dominica marks the route from a popular resort to the town of Roseau following Hurricane Maria. ©Dominica Government, 2017.



The problem is that the term “natural disaster,” which often puts a slight and too politically convenient emphasis on the word natural, blurs the causal picture in the public mind and subtly shifts responsibility for disaster losses away from their root cause. This blurring is particularly relevant to land use and building standards decisions, which are overwhelmingly political—and largely determine loss patterns and levels. We have to change that game.

At every opportunity, from social media to formal media interviews to op-ed submissions and public presentations, the research community must challenge the usage of the term natural, particularly after a damaging event: This was not a natural disaster. We are the ones who built there. We are the ones who opted for less stringent codes. We are the ones who failed to provide for mass evacuation in those areas. This is not nature’s fault. This is on us, and on our leaders specifically.

To be clear, this assertive role for the research community means becoming more political in our advocacy, engaging in that arena and with the media, and speaking truth to power. The responsibility is particularly strong for researchers in higher education, because the values and norms in those institutions, including academic freedom and tenure, are crucial protections that allow us to speak truth to power with at least a modicum of professional and financial safety.

After all, if we the research community, with our protections, don’t challenge a terribly misleading but popular term, who will?

### About the Author



*Richard Olson is director of the Extreme Events Institute and director of the International Hurricane Research Center at Florida International University.*



## America's Deathtrap Schools

*Using tape and existing signage, the words Joplin High School are transformed following a 2011 tornado that demolished the building.*  
 ©U.S. Army/John Daves, 2011.

May 13, 2018

By Lori Peek

*This article was first published on April 7, 2018, by The New York Times.*

Last week, thousands of teachers in Oklahoma and Kentucky walked out of their classrooms. West Virginia teachers did the same thing in February, and Arizona may be next. They are protesting state governments that are failing to pay teachers a decent wage, replace outdated textbooks, ensure manageable class sizes and fix school buildings in need of repair.

But our schools have even bigger problems.

Every weekday during the academic year, more than 50 million children across the United States enter public school buildings. Many of these buildings are so dilapidated and poorly designed that children's health and safety are at risk.

Some are in floodplains or lack heat or air conditioning. Others lie near fault lines and haven't been built to withstand earthquakes.

Young Americans are coming of age in a world that is drier and hotter than ever before. Wildfires, severe storms, floods and other environmental extremes will become more frequent and intense. Natural hazards, when combined with crumbling infrastructure, can lead to disaster.

Consider tornadoes. About 1,200 occur annually in the United States. Oklahoma also happens to be one of the most tornado-prone states in the nation. In May 2013, 56 schools there were damaged or destroyed by tornadoes, including Plaza Towers Elementary School, where seven children were killed. That school did not have a tornado shelter or safe room. State Representative Rebecca Hamilton said that every child who died there "was our responsibility." She added: "A tornado didn't kill them. We did."

Fewer than half of public schools in Oklahoma have a tornado shelter, and in 2017 the Oklahoma Uniform Building Code Commission quietly removed the requirement that new schools have them. Oklahoma teachers are lobbying lawmakers for \$200 million in increased school funding over the next three years. But it would cost more than \$1 billion just to protect the state's schoolchildren from tornadoes.

Flooding is the most common and costly natural hazard in the United States. According to a report from the Pew Charitable Trusts, 6,444 schools — which serve nearly four million students — are in places highly vulnerable to flooding. Before West Virginia teachers walked out of their classrooms to demand higher pay, many were flooded out following historic rainfall in June 2016. At least 35 schools sustained minor to severe damage.



©John Daves, U.S. Army, 2011 and second picture to:  
 ©Christopher Mardoff, FEMA, 2013.

Heat waves claim more lives than any other natural hazard, and in 11 of the country's largest school districts, in addition to countless smaller ones, many schools do not have air-conditioning.

In the Santa Maria-Bonita School District in California, teachers report that classroom temperatures sometimes reach 90 degrees. Thirty percent of the classrooms in the district lack air-conditioning, primarily because they are in old buildings that do not have the electrical capacity to support portable units. It would cost upward of \$45 million to install central air in all classrooms. In 2015 the teachers' union asked the school board for that funding, but the request was denied. Some teachers have resorted to offering sweaty and distracted students small cooling towels purchased with donated funds.

At the other end of the temperature spectrum, cold snaps have left children shivering in schools with malfunctioning boilers and drafty windows that do little to protect them when temperatures dip below zero. Low-income and black and Hispanic students are more likely to attend such poorly maintained schools.

This winter, Marietta English, president of the Baltimore Teachers Union, wrote in a letter to the school system's chief executive, Sonja Santelises, that "trying to provide a stable learning environment in these extreme conditions is unfair and inhumane." Santelises acknowledged that "too many of our buildings have outdated heating systems, poor insulation and aging pipes as a result of years of inadequate funding for maintenance and facilities improvements."

When it comes to earthquakes, we have seen some progress in terms of seismic upgrades for schools in states such as California and Oregon. But many other places lag woefully behind.

In Utah, hundreds of old school buildings with unreinforced masonry lie along or near the Wasatch Fault and could suffer serious damage, including complete collapse, in an earthquake. And in Washington, one in three children attend schools built before seismic construction standards were adopted statewide. The most unsafe schools are largely in poorer districts.

This is another reminder that these issues are not just environmental. They are social justice issues, too.

If we legally require children to attend school, then we should be held accountable for keeping them safe there. We need to see a real investment in our nation's school infrastructure and emergency planning efforts.

The American Society of Civil Engineers, which assigned our deteriorating school facilities a D+, estimates that just maintaining and operating them will cost \$58 billion annually, while upgrading them would cost \$77 billion annually.

We also need to spend more on predisaster mitigation efforts like reinforcing old schools and building storm shelters. The National Institute of Building Sciences recently reported that the nation could save \$6 for every \$1 it invests in mitigation by limiting the damage when disasters occur. And last year the Federal Emergency Management Agency issued guidelines, which I helped develop, on school building safety and emergency preparedness that all school systems should follow.

Students recently walked out of school to draw attention to gun violence. Should they do the same to protest all the other ways their safety is being put at risk? What would happen if children walked out of schools that are in floodplains or near fault lines? Should those without access to storm shelters in Tornado Alley refuse to show up until lawmakers do something? Should students who are too hot or too cold to learn just put down their pencils?

Of course, this is not really an option. Children's educations are too important to interrupt, and many students who attend shoddy schools may never experience a catastrophe. But we need to spend whatever time and money it takes to ensure those buildings are safe. Well-meaning parents shouldn't have to hope, as they send their kids off to school, that their loved ones will graduate before the next big disaster strikes.

## About the Author



Lori Peek is director of the Natural Hazards Center and professor in the Department of Sociology at the University of Colorado Boulder. She studies vulnerable populations in disaster and is author of *Behind the Backlash: Muslim Americans after 9/11*, co-editor of *Displaced: Life in the Katrina Diaspora*, and co-author of *Children of Katrina*. She helped write the FEMA P-1000 guidebook, *Safer, Stronger, Smarter: A Guide to Improving School Natural Hazard Safety*.



# Value-Added: Analysis of Social Return on Investment for FEMA's Whole Community Approach

June 10, 2018

By Liesel Ritchie, Carolyn Kousky, Kathleen Tierney, and Simone Domingue

The recent Natural Hazards Mitigation Saves: 2017 Interim Report, found that disaster mitigation projects save \$6 for every federal dollar spent. In 2016, FEMA's Individual and Community Preparedness Division funded researchers at the Natural Hazards Center and Resources for the Future to develop methods to assess the return on investment from FEMA's Whole Community concept and resilience-building activities.

Unlike the 2017 study, which focuses on the benefit of physical mitigation investments, our recent research concentrates on the returns to investment in community-based efforts such as disaster preparedness, outreach, partnership building, and public education—the whole community activities that are often more difficult to quantify. The objective of the present study was to develop methods and approaches that could be used around the country.

Return on investment (ROI)—the net earnings of a project divided by costs—is an economic calculation traditionally used as a decision aid in the private sector for evaluating investments. ROI provides an easy metric for comparing projects by their expected returns.

In the past several decades, there has been growing interest in using ROI to evaluate a range of public programs. This expansion has been accompanied by a broadening of what returns and costs are considered. When social benefits are included, the analysis is often termed social return on investment, or SROI. SROI is closely linked with other forms of program evaluation because it draws heavily on stakeholder engagement and uses logic models or impact maps to guide the analysis. To date, however, applying SROI in the preparedness context has been fraught with challenges.

One of the first tasks in this study was to associate the typical components of a logic model—inputs, outputs, and outcomes—with the costs and returns in examining SROI (See Figure 1). The costs roughly correspond to the inputs in a traditional logic model. The outputs produce a variety of outcomes. These outcomes are at times the “returns” in an ROI model, and at times they produce the “returns.”



The study team selected Tulsa, Oklahoma, as a case study site for the research. With a long record of community-based disaster risk reduction activities, Tulsa was an ideal place to develop prototype approaches to measuring returns on whole community investments—approaches that other communities might want to use to better assess the costs and benefits of resilience-related activities. The study team conducted 43 interviews in Tulsa with key actors who had long-term experience in the city's whole-community preparedness and resilience activities.

The study informed the development of a 14-step process for conducting SROI analyses for whole community activities (See Figure 2). These steps are:

1. Ensure that the community is supportive of SROI analysis
2. Establish project budget and secure funding
3. Determine study scope
4. Identify stakeholders
5. Identify stakeholder inputs, outputs, and outcomes
6. Create a logic map
7. Determine data collection procedures for inputs/outputs
8. Implement data collection
9. Determine attribution
10. Identify necessary non-market valuation studies to be undertaken
11. Conduct valuation studies
12. Value other inputs and outcomes
13. Calculate SROI metric
14. Conduct sensitivity analysis

The study also identified two primary sets of concerns for those wishing to carry out SROI studies on preparedness activities.

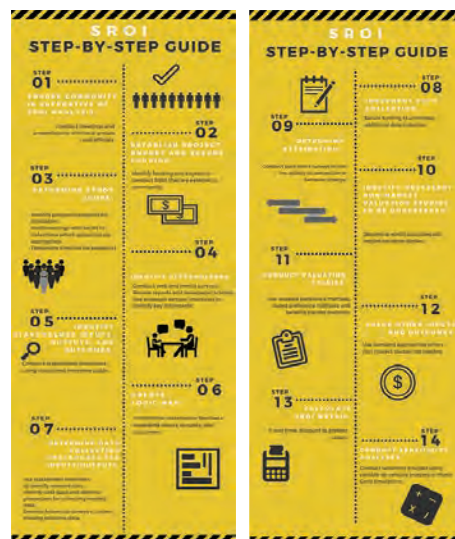
The first concern is the appropriateness of using SROI methods to assess these specific types of activities. Although demonstrating that positive returns on preparedness investments can be beneficial to organizations and agencies, it can be



*Community Can be Beautiful* by Alan Levine. Public domain, 2017.

extremely challenging to value many of the benefits of these programs in dollar terms. It can also feel inappropriate to some stakeholders to express changes to life, safety, and well-being in dollar terms. Neglecting these difficult-to-monetize impacts, however could show insufficient returns at a given point of time, which could jeopardize funding for preparedness programs. Relatedly, preparedness investments can have many spillover benefits and there is often not a clear boundary to the analysis—in other words, it is difficult to decide when to stop counting.

The second set of concerns involves the practical feasibility of conducting such analyses. SROI studies can be time consuming and timelines must take into account stakeholder schedules and commitment to the research. Special expertise and training are also required. Finally, SROI studies must be able to deal with counterfactuals—that is, to show that observed returns are actually the result of specific preparedness programs and not attributable to other factors. There will be times when it will be prudent to ask whether the benefits of a credible SROI study justify the costs.



We do not mean to imply that it is not feasible to assess whole-community activities using SROI and ROI methods. It is feasible, but those wishing to conduct such studies should be aware of the following caveats:

- First, SROI studies in areas similar to disaster preparedness are limited. Many of the publications we reviewed for our study that claimed to have used SROI methods did not actually quantify or value any outcomes. Instead, they might simply use the framework SROI provides to look qualitatively at investment impacts.
- Second, methods for evaluating benefits from preparedness activities are less well developed than those for assessing brick-and-mortar mitigation activities and will require new market valuation studies.

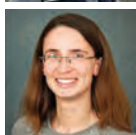
In our research, we identified a number of difficulties with implementing fully-quantitative SROI studies for whole community activities. For example, the interviews conducted for this study indicate that program personnel lack time and resources to collect and track the kinds of data needed for such analyses and that by and large they lack the expertise to conduct analyses on their own. Future studies will need to come with adequate additional funding and be carried out by qualified researchers.

At the same time, we also found a strong community-level interest in pursuing approaches that could help bolster the case for the benefits of these investments. Given the challenges and costs associated with conducting rigorous and credible SROI analyses of whole community activities, it might be prudent to select a few cases for thorough examination and use the results of those studies to guide broader research.

## About the Authors



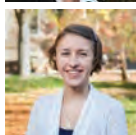
*Liesel Ritchie is associate professor at Oklahoma State University and former associate director of the Natural Hazards Center at the University of Colorado Boulder. Ritchie has more than 20 years of experience in evaluation and research and has studied a range of disasters, including the Exxon Valdez and BP Deepwater Horizon oil spills; the Tennessee Valley Authority coal ash release; Hurricane Katrina; and earthquakes in Haiti and New Zealand. Since 2000, her focus has been on the social impacts of disasters and community resilience.*



*Carolyn Kousky is a fellow at Resources for the Future. She has published numerous articles, reports, and book chapters on the economics and policy of natural disasters and disaster insurance markets. Kousky was a member of that National Research Council Committee on the Analysis of Costs and Benefits of Reforms to the National Flood Insurance Program. She has a bachelor's in Earth Systems from Stanford University and a PhD in Public Policy from Harvard University.*



*Kathleen Tierney is professor emerita of sociology and former director of the Natural Hazards Center at the University of Colorado Boulder. She has spent her career studying the social dimensions of many types of disasters, including hurricanes, earthquakes, floods, chemical disasters, and terrorist attacks. Her most recent book is *The Social Roots of Risk: Producing Disasters, Promoting Resilience*.*



*Simone Domingue is a doctoral candidate in the department of sociology at University of Colorado Boulder and a graduate research assistant at the Natural Hazards Center. She also serves as the assistant editor of the *Natural Hazards Review*. Her research concerns the drivers of social and ecological harms and explores how social contexts affect the formulation and implementation of hazard related policies. She is also interested in public participation in environmental decision-making and hazard mitigation.*



## Cost-Effective Building Regulations Should be Embraced, Not Feared

*A badly damaged home stands in Moore, Oklahoma, after a 2013 EF5 tornado. Stronger building codes were adopted following the devastating event. ©Dave Malkoff, 2013.*

December 13, 2017

By Kevin Simmons

Recent hurricanes, tornadoes, wildfires, and other disasters have had widespread economic and societal ramifications beyond the obvious suffering of residents. Hurricane Harvey temporarily decreased employment in South Texas, the California wildfires devastated wine producers, and Hurricane Maria left Puerto Rico without power, water, and jobs for its citizens.

Although we cannot control Mother Nature, it is within our grasp to lessen the impacts of disaster and increase community resilience. Regulations that ensure homes are built to safely withstand potential hazards is one way to do that. To achieve such improvements, however, will require leadership, collective will, and a whole community effort.

Instituting regulations to protect against natural hazards aren't always well-received because they are thought to cost too much. But my research shows that mitigation can be cost effective in the short- and longer-term. When actions that lessen disaster impacts can be shown to pay for themselves, the ability to move from theory to adoption is improved.

One such action is strengthening building standards to protect against violent wind storms. For instance, after Hurricane Andrew in 1992—which damaged 25,000 Florida homes and drove 11 insurance companies to bankruptcy—wind engineers developed design methods to strengthen the ability of a home to withstand wind damage. When these methods are used, homes are less likely to suffer wind damage and when damage does occur, it is minimized.

By 2002, the state of Florida had fully implemented a statewide code that adhered to these enhanced design principles. Soon afterward, the state was struck by seven land-falling hurricanes, four of which reached wind speeds sufficient to be rated Category 3 storms. Afterwards, I and my co-authors at the Wharton Risk Center and National Center for Atmospheric Research examined the performance of the Florida Building Code. We found that homes built to the new code had up to 72 percent less damage and resulted in \$6 in loss reduction for every \$1 spent in added cost, with an expected payback of less than 8 years. Despite such impressive results, Florida is alone in adopting a statewide code based on wind engineering principles—and pending legislation could reduce those standards.

While municipalities do not have to wait for states to impose strong local building codes, many officials and community leaders fear that the added cost of adopting more stringent standards will drive away development, along with the additional tax revenue and economic activity it brings. Here, another case is instructive to help assuage those potentially unfounded fears.



*A house in the Florida Keys shows repairable damage after a storm. ©David Prevatt, 2017.*



Moore, Oklahoma, adopted a stronger building code after the 2013 tornado that killed 24 people, including seven children at a local elementary school. While the raw tragedy of that storm likely played a role in their action, it was still a risky move since potential loss of development could follow.

To determine the impact of the codes on the Moore real estate market, I and another economist collected real estate transaction and building permit data from Moore and adjacent Norman, Oklahoma. We used a Difference in Differences regression model to test for statistical differences between Moore and Norman both before and after the implementation of the new code. We ran three tests—first for price per square foot, then for weekly sales, and finally for new permits. In each case, there was no change in the new home market in Moore as compared to Norman, from before the code implementation and afterward.

The results of this study call into question the notion that developers will simply move projects to communities where costs are lower. One reason for this could be that better construction is in demand and the town that provides it is rewarded with homebuyers seeking increased safety. Studies have shown that mitigation can increase value in real estate markets where there is heightened demand for homes with mitigation features. While Moore might have taken a risk, the community provides an example of how towns can benefit when they embrace strong construction standards rather than fear them.

Hazards research cannot stop disasters from occurring. But we can provide guidance to communities on how to reduce impacts. When policymakers are too often willing to shun new regulation, it is imperative to illustrate that while costs do exist, so do benefits. Often, the societal benefits of safety, wellbeing, and even future economic development, far exceed initial costs.

### About the Author



*Kevin Simmons is a professor of economics at Austin College and an affiliated scholar with the National Institute for Risk and Resilience at the University of Oklahoma. His research has focused on the economic impact of natural hazards and the public policies that address them.*



## What Comes After Hurricane Harvey for People with Disabilities? Restoring, Recovering, and Rebuilding

*A Houston-area man is rescued by helicopter after Hurricane Harvey. ©Daniel Farrell, U.S. Air National Guard, 2017.*

September 21, 2017

By Laura Stough

As Houston and the 58 disaster-declared counties that surround it begin the long process of post-Harvey recovery, important pre-existing inequities will be revealed. The widespread flooding produced by Hurricane Harvey affected approximately 6 million people, including people living with mobility, sensory, cognitive, and mental health disabilities. Given the disability rate in Texas of 18.7 percent, approximately a million people with disabilities have been directly affected by this disaster.

People with disabilities are more likely to lose their homes, to have property damage, and to die in disasters. They are more likely to be separated from their family members, overlooked by relief volunteers in shelters, and to suffer injuries or health-related complications. Compounding these difficulties, people with disabilities already were more likely to live in poverty, be unemployed, and have limited access to health care before the storm. These factors suggest disaster recovery for these families will take longer and be more complicated on many fronts.

### Restoring Disability-Related Resources and Services

Since Harvey made landfall, the Center on Disability and Development at Texas A&M University has tracked numerous reports about the critical resources needed by people with disabilities. While most people experiencing disaster have the same immediate necessities—food, shelter, and medical attention—those with disabilities can have additional requirements, such as ramps in shelters, special formulas for babies, food for assistance dogs, and access to sign language interpreters. Perhaps most commonly needed post-disaster is durable medical equipment such as wheelchairs, walkers, oxygen equipment, and hearing aids.

Conditions in shelters can be particularly challenging for individuals who need accessible toilets and showers or electricity for motorized wheelchairs, ventilators, and cardiac devices. More than 20 percent of individuals with a disability require assistance with self-care or independent living activities such as bathing, dressing, or preparing meals. The widespread impact of Hurricane Harvey means that the home health care aides and family members who normally provide this support may also have been affected, disrupting continuity of care. In addition, services such as physical therapy, speech therapy, dialysis, or medical support all have the opportunity to be interrupted in the post-Harvey environment.



*A Haitian woman with mobility issues navigates debris after Hurricane Matthew.*

©Christian Blind Mission UK, 2016.

## Recovering through Access to Disaster-Related Resources

More than 93 percent of individuals with disabilities in Texas live in the community rather than in institutional, nursing home, or residential care. Equal access to disaster-related information enables people with disabilities who live independently to participate in their own recovery. However, populations with hearing disabilities will need information in print or sign language, while people with reading or cognitive disabilities will need materials easy to read. People with disabilities already encounter barriers in housing, transportation, and employment. Case managers with disability-related expertise can navigate the complex recovery process and connect them to disaster-related resources. Such resources are essential to ensuring a complete and equitable recovery process.

## Rebuilding for Accessibility and Inclusion

Many of the homes lost during Hurricane Harvey by people with disabilities would have had modifications such as ramps, alerting systems, and adapted bathrooms. Similarly, cities and towns lost crosswalks with alert features, buses with wheelchair lifts, dialysis centers, and home health services that enabled people to live in their communities. An estimated 300 schools, most which provided special education services, have sustained damage. To serve these students, special instructional materials and communication devices will need to be replaced and access to special educational records restored.

Unfortunately, past disasters show that people with disabilities will continue to face barriers unless public infrastructure is built back in a way that supports accessibility. Accessibility applies not only to buildings, but also to transportation, communication, education, and healthcare systems. Universal building design principles should be used to build back better so that people with diverse physical, sensory, and cognitive abilities are not differentially threatened by future disasters. Such design often serves other populations, too—for instance, ramped entryways facilitate quicker evacuations than stairs.

Although people with disabilities will face different difficulties during Hurricane Harvey recovery, they will share the same goals as other survivors—most want to return to their homes, neighborhoods, and towns. However, we need to consider how to redesign and reconstruct those homes, neighborhoods, and towns during the rebuilding process so that new infrastructure is accessible and inclusive for all of the survivors of Hurricane Harvey, as well as resilient to disasters yet to come.

### About the Author



*Laura Stough leads Project REDD: Research and Education on Disability and Disaster at the Center for Disability and Development at Texas A&M University. She has produced more than 50 academic publications on the social, educational, and psychological experiences of individuals with disabilities, including the book *Disaster and Disability: Explorations and Exchanges*, co-edited with Ilan Kelman.*





## Ending Bias in Disaster Mitigation and Recovery Policies

*Hurricane Matthew devastated Lumberton, North Carolina in October of 2016. More than a year after the catastrophic flooding, affordable public housing units remained vacant and unrepaired. ©Elaina Sutley, 2018.*

June 10, 2018

By Elaina Sutley

In early 2018, I co-led a team of engineers and social scientists conducting a Hurricane Matthew recovery investigation in Lumberton. We observed that disaster damage was uneven across individuals, households, and neighborhoods. This disparity is largely a consequence of biased disaster mitigation. Lumberton was rife with examples of disparate losses across its community. This is a problem that arches across many hazards.

For flood prone areas, we often see biased mitigation through using levees to rationalize building in a floodplain, where it is low- to marginally middle-class households who reside in these areas, even though decades of disaster scholars have pointed out numerous failure of levee systems. For flood and other hazards like earthquakes, updating the building code is a common form of mitigation for new construction. Over decades and particularly for multi-family rental housing, high-end apartments and condominiums are updated or newly constructed while outdated, structurally deficient apartments become affordable housing. Renters lack the power to make decisions to adopt and install structural retrofits thus they live at the safety level decided by others.

These are just two examples. Across the board, biased disaster mitigation leads to unequal disaster impacts and differential recovery rates in cross-sections of communities. Disparate recovery rates are exacerbated by overlooking recovery policies. These policies span disaster type and include withholding aid to retrofit or rebuild a home to a higher standard, particularly from renters, strict requirements on proving home ownership to receive recovery aid —difficult for those who lose all of their belongings in the disaster— and requirements to demonstrate damage was not, even in part, caused by deferred maintenance. In several instances, recovery assistance intended to support low-income neighborhoods, takes more than a year to be received, leaving residents displaced and in unstable housing.

Fortunately, these problems are solvable using an approach that ameliorates biased disaster mitigation by investing in better infrastructure in socially vulnerable neighborhoods through subsidizing a portion of costs, and updating recovery policy to not overlook vulnerable households. Such an approach would decrease overall disaster losses and shorten the time it takes to recover, particularly among marginalized residents, as I learned from my dissertation research which focused on the impact of earthquake damage on socially vulnerable households.



*Earthquake retrofit projects, such as this one on the University of California Berkeley, are meant to make people safer, but care must be taken to ensure they are done evenly across communities. ©Leonard G., 2004.*

The research, which was later published as a two-part series (Volume I and Volume II) includes a meta-analysis of the post-earthquake empirical literature. I and my collaborators compiled a substantial number of domestic and international post-earthquake findings that consistently demonstrated more socially vulnerable groups experienced higher rates of physical injury, death, and negative mental health consequences, particularly post-traumatic stress disorder (PTSD), after experiencing an earthquake. Consistent with the hazards literature, we defined social vulnerability according to measurable characteristics: female, low income household, children under the age of 18, those above the age of 65, low education level, and racial minority and ethnicity.

New and improved policies can bring the needed solution into action. Engineers have already designed infrastructure to ensure highly effective structural and nonstructural performance to earthquakes, wind, and floods. Our team has pointed out that targeting vulnerable neighborhoods for mitigation is highly effective at reducing overall disaster losses and speeding community recovery. In fact, our work has revealed that in some cases these mitigation strategies can save billions of dollars, as well as tens of thousands of lives in potentially catastrophic events. This finding justifies subsidizing the initial investment.

Shifting the focus and targeting resources to the most socially vulnerable is a practical solution. The approach has already been implemented in San Francisco and Los Angeles for one building type. The cities, which have high seismic risk, adopted soft-story seismic retrofit mandates in the past five years that make both the cities and their citizens more resilient. Many of the affected buildings are rent-controlled; losing affordable housing units after an earthquake would be devastating for low-income populations and the cities as a whole. The retrofit mandates had complementary tax incentives for building owners and set limits on the total and per month cost that could be passed on to residents.

Progress has been made in some earthquake-prone areas. But earthquakes are not the only natural hazard that threatens our communities, as hurricanes, flooding, and wildfire disasters in the past year have made clear. Where else could we target time, attention, and resources? Social inequality and disparities are prevalent across the country. After each disaster, we see areas hit the hardest are those in which unemployment, poverty, low income, and lower levels of education were already factors. If we want to achieve true justice and equity in disaster mitigation, we have to work towards ending bias in disaster mitigation and recovery policies everywhere.

### About the Author



*Elaina Sutley is an assistant professor in structural engineering at the University of Kansas. Sutley's research is at the nexus of structural engineering, social science, and public policy, with an emphasis on wood buildings and housing. She actively develops interdisciplinary approaches to assess mitigation, predict losses, and model recovery.*



## There's Something in the Water...

*A Texas port is inundated after Hurricane Harvey. The Coast Guard conducted port assessments on August 31 to look for potential oil or chemical spills. © Patrick Kelley, U.S. Coast Guard, 2017.*

September 8, 2017

By Kathleen Tierney

Disaster researchers often say that disasters don't happen, they unfold. What they mean is that a key characteristic of disasters is that they produce impacts that cascade and spread over time. We see this now with Hurricane Harvey, which is shaping up to be one of the costliest and most disruptive disasters in U.S. history. What started as a hurricane and a deluge is now transforming into a complex public health emergency of epic proportions—one that is creating known and unknown threats and both short-term and longer-term dangers.

### What We Know

The greater Houston area is home to the largest concentration of petrochemical facilities in the United States. Facilities affected by Harvey have sustained damage, released toxins, and even experienced explosions and fires, as was the case with the Arkema facility in Crosby, Texas.

Regarding known threats, floodwaters have surged over places containing many types of toxins, such as landfills, Superfund sites, and agricultural and petrochemical plants. Those waters also contain biological hazards such as fecal matter, *E. coli* bacteria, shigella, and even *Vibrio vulnificus*, a type of bacterium that can enter the body through cuts and wounds and that kills about one in every four people it infects. *Vibrio* is rare, but after Hurricane Katrina there were twenty-two new cases of the disease, and five of those victims died. MRSA, an antibiotic-resistant variety of staph bacterium, was also seen with greater frequency after Katrina.

Many of those who were confronted with Harvey's wrath while escaping their homes could have sustained cuts and scrapes that left them open to infection and also could have ingested contaminated water while wading through the murky depths. They are at risk from waterborne infectious diseases and the symptoms they can cause, such as diarrhea and dehydration (in the case of *E. coli* and shigella) or blood poisoning (in the case of *Vibrio*).

Hurricane winds typically carry off mosquitos and their larvae. Now they are back with a vengeance, and they thrive in standing water. With mosquitos come the risk of diseases such as West Nile and even Zika and dengue. To avoid these and other carriers of disease, people in the impact area should cover up as much as possible, use safe insect repellants, and get rid of standing water. After Hurricane Katrina, cases of West Nile increased both immediately and over subsequent months, indicating that mosquito-borne illnesses may be an ongoing threat to those affected by Harvey.

Mold is another hazard that will become increasingly severe in coming days and over the longer-term. Mold can cause serious respiratory symptoms and inflammation, as well as toxic reactions. Black mold, which releases toxic fumes, will be common in many areas that were exposed to flooding. With so many properties affected, the potential for epidemic levels of mold-related health problems is very real. Mold can be deadly. Care must be taken to deal with mold as quickly as possible, and residents and recovery workers should wear masks, gloves, and appropriate protective clothing when working in mold-infested areas.



## What We Don't Know

These public health threats are real and they will be enduring. What we don't know is how the government and private sector will respond to these critical public health challenges. And there is reason for concern.

The Emergency Planning and Community Right to Know Act of 1986, also known as SARA Title III, required producers and handlers of hazardous materials nationwide to make their inventories available to the public. It also mandated the formation of local emergency planning committees (LEPCs) that were charged with developing strategies for reducing risks associated with dangerous chemicals and planning for explosions, fires, and other types of emergencies at facilities that pose health and safety risks.

Although designed to protect the public, that legislation has been weakened over time in many parts of the country, and Texas is no exception. A series of reports in the Houston Chronicle in 2016 called *Chemical Breakdown* described how hazardous material risks to the public have gone unaddressed as a result of inadequate inspection and enforcement by responsible agencies such as the Occupational Safety and Health Administration (OSHA), neglect of zoning regulations that allowed hazardous facilities to operate near homes and schools, and a lack of resources for LEPCs. On top of that, Texas legislation allows hazardous materials facilities to withhold information from the public on the questionable grounds that releasing such information could aid terrorists.

In this environment, which is hostile to the public's right to know the risk it faces, facilities handling dangerous chemicals have stonewalled requests for information. Even now, with recent explosions at its plant in Crosby, Arkema still will not disclose to the public what is in the smoke that billows from its facility. The public is now demanding to know what threats are present in the air and in the floodwaters unleashed by the hurricane—knowledge that is critical in dealing with the public health emergency that is unfolding, slowly but surely, in Harvey's wake.

### About the Author



*Kathleen Tierney is professor emerita of sociology and former director of the Natural Hazards Center at the University of Colorado Boulder. She has spent her career studying the social dimensions of many types of disasters, including hurricanes, earthquakes, floods, chemical disasters, and terrorist attacks. Her most recent book is *The Social Roots of Risk: Producing Disasters, Promoting Resilience*.*



## Do I Stay or Do I Go? Hurricane Risk Perception and Evacuation Behavior

Evacuation BBQ Hurricane Harvey evacuees wait in line for a barbecue lunch at a Louisiana shelter. ©Sharon Karr, 2017.

November 1, 2017

By Craig Trumbo

Emergency managers and academic researchers focused on disasters have a common interest in understanding the factors that influence evacuation decisions made by the public. While emergency evacuations can occur in a variety of circumstances, one of the most common—and in many ways, the most complicated—involves evacuation from land falling hurricanes. A significant amount of research has been directed to understanding this context of decision-making.

How do members of the public make a decision to evacuate in the face of a hurricane? Why do some people stay put, even after mandatory evacuation orders have been issued? Why do others leave when the sun is still shining and the skies are still blue?

There is no one answer to these questions. There are a great many practical considerations that influence evacuation behavior, such as work responsibilities, care for family members with special needs, concern for pets, and access to transportation and savings. Past experience with hurricanes is also a critical factor, as is the nature of the coming storm and location of landfall. And of course, forecast and official information is critical.

One influence that is sometimes overlooked, however, is the way in which people view risk. This aspect of evacuation decision making is relatively subtle compared to practical concerns, but nonetheless has a strong effect on the actions people decide to take.

Hurricane risk perception can be divided into two areas of influence. On one hand, people judge risk based on objective thinking about information and facts. This is often referred to as *cognitive risk perception*. On the other hand (and at the same time), people also judge risk based on emotion. This is usually called *affective risk perception*.

While both modes of judgment play a role, during information-intensive events such as hurricanes cognitive risk perception processes may be especially important as such judgments are typically formed from information that the individual encounters. This information can come from a wide variety of official and unofficial sources. One of the interesting aspects of this form of risk perception is that people often update cognitively based risk perception as they encounter new information.

Similarly, affective risk perception also plays a strong role. In fact, the emotion-based processes of risk perception often have the final say. But they don't operate in isolation. Rather, emotional reactions to hazards can be built on cognitive processes. A great many forces are at play in affective reactions to risk, such as a past experience with the hazard or even with other hazards. People also have differing orientations toward risk, with some having more risk averse personalities than others. Demographic characteristics such as age and gender can also play a role, as can various social aspects of an individual's life, such as group affiliation and related socialization experiences.



A line of vehicles snakes out of Corpus Christi towards San Antonio in advance of Hurricane Bret.

©Dave Gately, 1999.

Taken together these two components of risk perception shape how people (individually or in groups such as families) decide to act. Understanding these processes, or at least understanding that they are at work, can provide an improved basis for providing and receiving emergency information, such as hurricane forecasts and evacuation orders. Members of the public can consciously take these processes into account as they make decisions. Simply being aware that decision making involves both information-based thinking and emotion can help clarify the process. Those who professionally communicate forecast and warning information can create more effective messages by purposefully taking these processes into account. Of course, at the same time, it remains critical to remember how much these decisions are influenced by other external factors related to one's social location, the nature of the decision being made, and the timeframe in which it must be made.

In these critical decision-making situations, all parties want action that maximizes protection. But hurricanes and other hazards can be complex and rapidly changing. When both senders and receivers of hazard and warning information understand this fundamental aspect of public risk perception and emergency decision making, the entire process of communication becomes much more focused and effective.

### About the Author



*Craig Trumbo is a professor in the Department of Journalism and Media Communication at Colorado State University. His research focuses on the way in which risk perception influences individual behavioral decision making. His work in this area has been applied to a variety of contexts that include health, environment, and disasters.*





## A Place to Call Home: Planning for Equitable Post-Disaster Housing Recovery

A wind-damaged home near Port Aransas, Texas, where Hurricane Harvey made landfall. ©Chip Van Zandt, 2017.

November 20, 2017

By Shannon Van Zandt

*This is a lightly edited and linked version of testimony\* about post-disaster housing recovery that was delivered to the Texas Senate Committee on Intergovernmental Relations on November 1, 2017. Because this is an example of research being shared to influence policy action, we are reprinting the testimony in full for this Research Counts.*

Good morning. For those of you whom I have not yet met, I'm Dr. Shannon Van Zandt, current department head of Landscape Architecture and Urban Planning at Texas A&M University. I'm also a faculty fellow with TAMU's Hazard Reduction and Recovery Center. I am one of the nation's leading scholars on housing recovery after disaster, particularly for low-income and minority populations and neighborhoods.

Over the past two months, I have visited several small Texas communities impacted by Harvey, including Port Aransas, Rockport, Fulton, Ingleside, and La Grange. I've also spent a lot of time talking with other scholars and practitioners who are experts on the flooding that Houston experienced, as well as to representatives of foundations working in the Houston area, to discuss what Houston and Harris Counties priorities should be during the recovery process.

Many of you may remember me from the last two legislative sessions, when I came to discuss the need for communities to pre-plan for recovery to expedite the restoration and recovery process after a disaster. Some of you toured some of the RAPIDO homes with us. You may remember that I have studied recoveries from Hurricanes Ike and Dolly extensively, and I have compared their recoveries to those experienced in many other communities that have experienced hurricanes and/or catastrophic flooding. While I don't think any of us could have predicted a storm like Harvey, we could—and did—predict the nature of damage that we've now seen. Further, based on my research and that of my colleagues, we can predict that the recovery process will be slow for our more vulnerable populations and that the outcomes over time will be unequal—furthering pre-existing inequalities and even exacerbating them.

We currently find ourselves in the transitional phase between response and recovery. Once rescue is complete and debris has been cleared, people are looking to return home from whatever sheltering solution they found. Most households have had their damage assessed, and have an initial settlement amount from their insurer or from [the Federal Emergency Management Agency], and they're ready to start rebuilding. Or they've been told that they will not be allowed to rebuild in place, and are trying to figure out what's next.

At this phase, the focus is on temporary housing—places for people to stay as they repair or replace their homes, or find new homes. Those who were adequately insured, or who have their own financial resources available, will be okay. They have already started rebuilding, and they can afford to find someplace to live in the meantime.



A RAPIDO House—a rapid-recovery housing model that allows residents to return to their property quickly—that was constructed in Brownsville, Texas after Hurricane Dolly. ©Chip Van Zandt, 2014.

Our current federal policy assumes that this is the case for everyone—that the private market will take care of these households. And for middle-to-upper income homeowners, it will. Homeowners in Cypress Creek and Kingwood, and even parts of Meyerland and Bellaire, will be mostly okay. The neighborhoods flooded by the Addicks and Barker releases will be mostly okay—mad, but okay. Vacation homeowners along the coast have homes elsewhere and are okay. But for everyone else—low- and moderate-income homeowners and renters, it will not be okay.

After Katrina, the solution was mostly mobile homes. After Ike, it was mostly rental vouchers that allowed households to rent on the private market. Neither of those solutions worked particularly well. This time, neither of those solutions can adequately meet the overwhelming need. There aren't enough trailers, and there are not enough apartment units. The community members that I have talked to are feeling lost. They don't know what their options are, and they don't know if or when anyone is coming to help.

Most are trying to come up with their own solutions, but they are thwarted by limited resources, by a lack of knowledge about resources that may be available to them, and by confusion about where it is safe to rebuild and where it is not. In other words, they don't have a plan in place, even for temporary housing, much less permanent housing. The risks of not solving this problem are considerable.

The delays and instability that they are experiencing will have long-term impacts. They will have impacts on local economies, many of which depend on low-wage workers. They will destabilize marginal households and may cause them to descend into poverty. They will put many families into crushing debt that they may never recover from. They will temporarily or permanently displace residents into areas that are less safe, less connected, and offer fewer opportunities. In some cases, small communities may cease to exist.

There is no example of a disaster housing recovery program that has been entirely successful. Although researchers learn something new with each new disaster, we have yet to get a handle on the problem. People are left out, recovery takes too long. A new system is needed desperately.

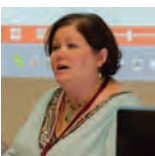
The most important thing we learned from our RAPIDO demonstration program is that pre-planning is necessary. A large scale temp-to-permanent housing program is simply not feasible without systematic planning—*before* the disaster. We have lost two opportunities over the last two legislative sessions to initiate a program that would allow communities—especially low-capacity communities along the coast—to work with our Hazard Reduction & Recovery Center to undertake such planning.

It's too late for us to respond to this disaster in any large scale way. But it is imperative that we not delay any longer. Planning takes time and it builds capacity locally, especially to respond effectively to things that the private market will not take care of. If left to itself, the only thing the private market will do is to replace affordable housing with unaffordable housing and put people back in harm's way. Many, if not most, of these communities were already struggling with affordable housing before the storm. Now it is a crisis.

Thank you.

*Written version of testimony provided by Shannon Van Zandt. Audio of the testimony is available on the Texas Senate Committee on Intergovernmental Relations website.*

## About the Author



Shannon Van Zandt is professor and interim department head of Landscape Architecture and Urban Planning at Texas A&M University, as well as a faculty fellow in the Hazard Reduction and Recovery Center. She is co-author of *Planning for Community Resilience: A Handbook for Reducing Vulnerability to Disasters* from Island Press (2014).



*Flood damage in the Southwest Houston home where the mother of a friend of Van Zandt's lives. ©Chip Van Zandt, 2017.*



## Ballistic Missile Threat Inbound: When Human Error is Really (Still) a Systems Error

Graphic by R. Nial Bradshaw. ©2017.

March 21, 2018

By Tricia Wachtendorf and James Kendra

It might be understandable to feel a degree of empathy for the Hawaii Emergency Management Agency (HI-EMA) employee who sent a false ballistic missile alert on January 13—many of us have felt the sinking feeling after hitting reply all on an email meant for one person.

Although the event stoked outrage, the explanation seemed reasonable: the wrong option was clicked in a screen menu. The response to the false alert by HI-EMA Administrator Vern Miyagi (who has since resigned) was both swift and seemingly appropriate.

“It’s my responsibility, so this would be my fault,” he stated in a press conference later that day.

Both Miyagi and Ige said human error caused the false alert, indicating that an employee (who has since been fired), had accidentally selected the wrong alert interface option while testing the system. Moreover, there was no protocol to officially retract the alert using the same interface. Although the agency began notifying counties and departments, such as the Hawaii Police Department, less than five minutes after the alert was sent, the only way to quickly inform the public about the mistake was via social media, which wasn’t monitored by everyone, and answering calls from concerned individuals.

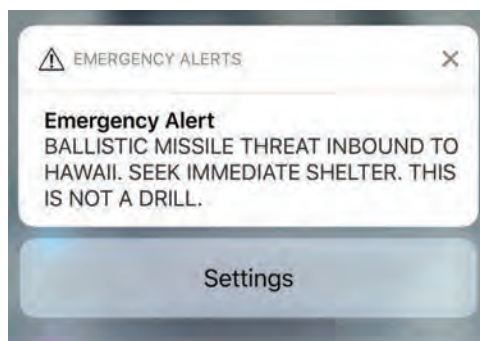
It was a full 38 minutes after the initial warning was issued—a length of time that felt like an eternity for those on the Islands who feared death or destruction, yet a relatively short time to turn the bureaucratic wheels of government—before a cancellation message was finally sent through the same automated alert system. To make matters worse, the governor didn’t know his Twitter password, just when he needed it the most. Another avenue for prompt correction of the error was closed off.

Two weeks later, however, a HI-EMA report on the incident, as well as a Federal Communications Commission report[(http://bit.ly/2tMpmcU indicated there were factors beyond human error at play.

According to the reports, the initial explanations of what transpired weren’t accurately represented. The employee who issued the alert claimed he had not heard the words “exercise, exercise, exercise” that normally precede a test drill and that he really believed a ballistic missile was actually headed to the Islands. The HI-EMA report stated it the employee had previously mistaken drills for real-world emergencies.

What can we take away from all this? First, the findings of these preliminary reports can have the unfortunate potential to over-emphasize human error. By placing the blame for this deeply upsetting event on individuals and citing human error as the primary cause of the crisis, the focus is shifted away from the larger organizational, even strategic, context.

Human error aside, the interface problem was still present. The fact that a false alert could result from a selection error is just as much of a problem today as it was on January 13.



A screenshot from a mobile device shows the erroneous missile warning issued in January.



There is an entire science that explains how technology and technical system designs can make human errors, such as the one in Hawaii, much more likely. There is also a long history of failing to improve designs even when repeated errors take place. Reply, for instance, is still located next to Reply all. We blame the sender, keeping the system interface intact.

Interface designers have criticized the placement of the test and real-world missile attack options in the same drop-down menu, but even if this crisis is enough to change that particular drop-down option, there is little assurance that future technical design will account for end user error. Actions with serious consequences should require some extra deliberation and counter action and not arise from a wavering finger, a momentary lack of attention, or someone's faulty sense making. Although, HI-EMA has indicated that a second person will now be required to confirm issued alerts, we think the incident in Hawaii should provoke a wholesale reconsideration of the potential for error, and not just in the emergency management realm.

The slow recovery from the error is also significant, and generates more questions than we presently have answers for. While HI-EMA could tweet a retraction, sending a retraction by phone alert—one that would reach all who had received the erroneous message—was thought to involve many steps, including contacting Federal Emergency Management Agency and programming a retraction message.

Why the subsequent confusion? There were conflicting reports on whether Hawaii officials contacted FEMA for permission to retract the alert. A news report said that FEMA permission was not needed, and that HI-EMA was seeking guidance on how to handle the situation. But the HI-EMA report stated they were getting "authorization." Clearly, there were misunderstandings. We can now see some form of what the sociologists Lee Clarke and Charles Perrow termed "prosaic organizational failure,"—a belief that systems were in place, that those systems worked, and a lack of awareness that the systems were tightly coupled. Once a mistake was made, turning back was difficult and time-consuming.

By now, most researchers are skeptical of human error as the cause of accidents without looking at larger contexts. What we do see, is a system's inability to anticipate, manage, and recover from such a mistake.

Diane Vaughan's work on the Challenger disaster revealed that the 1986 tragedy resulted not from mere human error, but rather from factors deeply connected to organizational culture and hidden aspects of technological interaction. We might consider her careful ethnographic approach to this topic, some twenty years after her book was first published.

Until the false ballistic missile alert, the system worked, but only in people's imaginations. Any individual can make a mistake—in fact, we should expect that. The new plan to have two people on hand for subsequent tests is an improvement, but this incident should provoke a much deeper examination of this key element of our emergency management system.

It's not likely that HI-EMA is the only agency in the United States to have such an interface, or to have different understandings of their role than their colleagues at FEMA have. Every aspect of the system should now be examined: from software and interface design, to procurement policies, to the fact that there is virtually no research at all on how emergency officials interact with their technologies or incorporate those technologies into larger multi-organizational, multi-jurisdictional systems.

Perhaps above all else, we can take a fresh look at the fragmented emergency management system in the United States and reexamine the roles, responsibilities, and expectations of agencies at all levels of government. Let's not make the mistake of simply chalking what happened in Hawaii up to human error. We would be wise to see this as a signal event for possible future breakdowns.

## About the Authors



*Tricia Wachtendorf is a professor in the Department of Sociology and Criminal Justice at the University of Delaware. She is the co-director of the Disaster Research Center and author of American Dunkirk: The Waterborne Evacuation of Manhattan on 9/11.*



*James Kendra is a professor in the School of Public Policy and Administration at the University of Delaware. He is the co-director of the Disaster Research Center and author of American Dunkirk: The Waterborne Evacuation of Manhattan on 9/11.*



## Through the Fog of Disaster: The Process of (Re)Creating Inequities

*The St. Bernard Public Housing development sits abandoned in 2006 after Hurricane Katrina. Plans were made to replace the development with low-income townhouses. Previous residents were promised assistance to relocate. ©John McQuaid, 2006.*

November 29, 2017

By Lynn Weber

It is unsurprising—and well-documented—that the same social processes shaping communities before disasters shape post-disaster outcomes. At the same time, disasters set in motion additional political processes that determine if, when, and how families are able to return and rebuild their lives and their communities. Despite their critical importance, these processes are rarely transparent and are largely governed by a government-corporate-elite alliance that sets the rules for recovery. A cautionary tale can be seen in the Hurricane Katrina recoveries of both Mississippi and Louisiana, where this type of political alliance produced even greater inequities than existed before the hurricane.

### Political Alignment of Federal, State, and Local Governments and Recovery Funds

In 2005, when Katrina made landfall, Republicans controlled the presidency and thus the executive branch, both houses of Congress, the Mississippi governorship, and the state's congressional delegations. Democrats, by contrast, led New Orleans and Louisiana. By any measure—extent of disaster, buildings damaged or destroyed, individuals and businesses affected—New Orleans and Louisiana suffered greater losses. Yet proportionate to their losses, Louisiana and New Orleans received fewer federal dollars for recovery. The Republican-led Congress ruled that no state could receive more than 50 percent of recovery dollars—thus limiting Louisiana and benefitting Mississippi.

In the fog of disaster, a state of emergency is used to justify the abandonment of ordinary regulations on government contracts thereby allowing, for example, no-bid contracts or waived minimum-wage requirements. In fact, in May 2009, Mississippi Governor Haley Barbour—who was roundly praised for his leadership in the state's Katrina recovery—told Congress the Community Development Block Grant (CDBG) program was an "...effective vehicle to deliver disaster relief, but only with sufficient latitude to insure recovery programs were not hampered by normal CDBG regulations and restrictions." The 2017 hurricane season has wrought havoc in Florida, Texas, Louisiana, and Mississippi—all states with Republican-dominated political leadership. Houston, a Democratic stronghold in a Republican-controlled state, had to fight the governor for its initial allocation of funding. Nationally, Congress is poised to allocate proportionately more funds, and to respond more quickly to Republican-led states than to the Democratic-led U.S. territory Puerto Rico, where, weeks after Hurricane Maria, residents are driven to drinking water from polluted rivers and Super Fund sites.

## State Governors and the Allocation of Individual Recovery Dollars

After Katrina, federal agencies such as the U.S. Department of Housing and Urban Development (HUD) sent recovery/housing rebuilding block grants to state governors who established priorities for allocation. Mississippi's Rebuilding, Recovery, and Renewal Commission—established by the governor to recommend priorities for recovery dollars—was led by a board of seven men: six white corporate CEOs and the African-American head of the NAACP. Although they held 50 public meetings across the state, the final priorities for housing grants were assigned to: 1) Insured homeowners; 2) Economic development and infrastructure; and 3) "Workforce" housing (i.e., housing for families above low-moderate income levels).

As a result of these priorities and the waivers that HUD granted (e.g., the statutory 70 percent low-moderate income benefit was reduced to 50 percent and the HUD secretary was allowed to waive even that requirement), CDBG money did not have to be spent to benefit low-moderate income housing. No money at all was spent on such housing until 2008, a full three years after the storm. This, among many other factors, left many families permanently displaced. By 2012, when all the funds had been allocated, only 7.81 percent had gone to low-moderate income housing.



*A family sits on a stoop in the St. Bernard Public Housing development on Martin Luther King Jr. Day in 2007. Crowds overcame chain link fences and barbed wire to take back the development after being blocked from returning to their homes for more than 16 months.*  
©Craig Morse, 2007.

## Rationales for Inequitable Treatment and "Deserving" and "Undeserving" Groups

Mississippi's powerful business and government leaders' framing of the disaster fit a larger narrative of Mississippi as deserving and Louisiana as undeserving of resources for recovery and positive attention by the media.

First, business and political leaders in the state argued that Mississippi was indeed more deserving because the damage it suffered was produced by a direct hit from the storm—it was a natural disaster. But the damage in New Orleans and Louisiana resulted from the failure of the levees—it was a man-made disaster. Second, they argued that the Mississippi government's response and recovery was efficient and effective, in part because of the government's close collaboration with the business community, while New Orleans' and Louisiana's government was characterized as corrupt and its response inefficient and ineffective. Finally, they portrayed Mississippians as self-sufficient, independent, and proud and New Orleanians as dependent, looking for government handouts, and even criminal. While race and class were rarely discussed explicitly by these powerful actors, the racialized insinuations and the class-based assumptions were never far from the surface of these arguments.

This dynamic is at work again today, with a dominant political party presenting a narrative that conflates deserving and underserving communities with their racial and ethnic composition and leadership, as well as their political affiliations. Similar processes are playing out in the contrasts made between Puerto Rico and the Virgin Islands versus Texas and Florida. These demonizing, controlling images then serve as the rationales for inequitable treatment—using race and the political parties most closely aligned with them to justify unequal allocations of money, resources, information, and aid. Later, they will likely be used to explain the rates of recovery that will inevitably follow.

### About the Author



*Lynn Weber is a distinguished professor emerita of psychology and women's and gender studies at the University of South Carolina and has been a leader in the field of intersectionality for more than 30 years. Her research has illuminated inequalities in the recovery process for Hurricane Katrina's displaced across the country and for communities along the Mississippi gulf coast.*





## When Safety is Not Enough: The Impact of Chronic Stressors on Rohingya Refugees in Exile

*Rohingya refugees enter Bangladesh after being driven from Myanmar. ©Zlatica Hoke, VOA, 2017.*

May 14, 2018

By Courtney Welton-Mitchell and Andrew Riley

The Rohingya, an ethno-religious group from the Rakhine region of Myanmar, have experienced decades of systematic persecution since the late 1970's. In 1982, they were stripped of citizenship by the Myanmar government, making them one of the largest groups of stateless people worldwide. The most recent wave of violence against Rohingya began in August 2017, when a military offensive against them resulted in hundreds of thousands fleeing to Bangladesh and other neighboring countries. The violence was labeled a "textbook example of ethnic cleansing" by the United Nations and some human rights groups have stated there is mounting evidence of genocide.

Today more than 800,000 Rohingya reside in refugee camps and nearby settlements in Bangladesh. The Balukhali/Kutupalong megacamp is now the largest refugee camp in the world. Another estimated 100,000 Rohingya have settled in Malaysia and many more have been forced to migrate elsewhere, including Thailand and Indonesia.

Rohingya refugees might find relative safety in other countries, but for many, leaving their homeland results in a new set of challenges and deprivations.

### Chronic Stressors in Exile: Poor Conditions and Lack of Human Rights

Refugee typically don't have the right to work, experience travel restrictions, and have limited access to healthcare and education. This is the case in both self-settled urban contexts, as well as in refugee camps, where limited access to food, water, and shelter can also be significant concerns. In addition, refugees can experience discrimination and harassment from local authorities and community members. Poor living conditions and a lack of human rights in the country of asylum can contribute to a pronounced sense of hopelessness.

Although humanitarians are increasingly focusing on the mental health needs of refugees and other displaced populations, little attention is given to the role of chronic stressors encountered in the host country, emphasizing, instead, events that occur during the acute phase of the emergency in the country of origin or while in transit.

### Impact of Chronic Stressors on Mental Health Among Rohingya in Bangladesh

Rohingya have been living in Bangladesh for decades. Life there has been difficult, even before the latest influx of refugees. A few years ago, we and other colleagues conducted research with Rohingya in refugee camps near the southern tip of Bangladesh. After returning to the area in the past few months, it was evident that conditions had deteriorated. The speed and number of recent arrivals, as well as the associated makeshift nature of the camps, contributed to a pronounced overcrowding and lack of adequate organization, infrastructure, and services in the sprawling settlements. The situation is likely to worsen with



*Woman makes her way between crowded structures in a refugee camp in Bangladesh. ©Digital Democracy, 2008.*

the coming monsoon season and the severe risk of flooding and landslides it brings. The need for basic services, including water, health, and especially shelter and sanitation, far exceeds the ability to provide them, according to the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA).

In our initial research, the common stressors identified by the 148 randomly selected Rohingya who were interviewed included:

- Lack of livelihood opportunities
- Difficulties obtaining sufficient food and water
- Inadequate shelter
- Discrimination/harassment from local community members
- Safety concerns
- Lack of freedom of movement
- Lack of access to services such as healthcare and education
- Inadequate sanitation facilities.

We then examined the impact of these chronic stressors on well-being. While it was clear that trauma directly affected mental health outcomes (measured here as symptoms of post-traumatic stress disorder), this relationship could be partially explained by chronic stressors. In addition, depression symptoms were associated with chronic stressors but not previous trauma exposure, which underscores the necessity of taking historical conditions and present context into account when designing interventions. Given the current situation in the camps, it appears daily stressors have worsened since this research was conducted.

## Impact of Chronic Stressors on Mental Health and Intimate Partner Abuse Among Rohingya in Malaysia

Although Rohingya in Malaysia are not living in refugee camps, they do face similar challenges. Many indicate that life in Malaysia is far more difficult than they expected. During the initial phase of our current research with Rohingya in Malaysia, we asked 75 people to identify the stressors they encountered in their daily lives. The most common were:

- Fear of arrest by authorities (police, immigration)
- Livelihood difficulties (limited work opportunities)
- Lack of sufficient income
- Concerns about extortion of money local authorities and others
- Difficulties accessing healthcare
- Lack of access to education for children
- Safety concerns
- Separation from family members
- Concern about family in Myanmar
- Difficulty obtaining legal documents

Such stressors—especially lack of employment opportunities, insufficient food, insecure legal status, and fear of arrest by authorities—were perceived by those we spoke with as contributing to poor mental health outcomes and an elevated risk for intimate partner abuse. Participants said some husbands were becoming increasingly abusive toward their wives as the daily stressors of exile exceeded their ability to cope.

The Rohingya in Bangladesh and Malaysia often experience stressors that are exacerbated by displacement and statelessness. Stressors emanating from inadequate resources to meet basic needs and human rights violations can severely impact well-being.

Over the decades, many lessons have been learned about how to best support the recovery of those who have been forced to flee after years of persecution and successive waves of violence. Yet, there are still large gaps in the systems and services designed to support Rohingya refugees in Bangladesh and Malaysia. With each passing day, the conditions become more dire and future threats to the health and vitality of the population loom larger. Given the ongoing and unfolding nature of the crisis, we hope you will learn more about how you can address budget shortfalls by contributing to organizations that help the Rohingya.

While donations to humanitarian organizations are important to ensure adequate food and shelter for those living in the camps, we must do more to address human rights violations in Myanmar and in countries where Rohingya are living in exile. We can begin by holding the government of Myanmar accountable for crimes against the Rohingya, encouraging the government of Malaysia to sign the refugee convention, joining the global movement to end statelessness, and learning more about promoting dignity and autonomy by allowing refugees and other forced migrants the right to work and to education.

### About the Authors



*Courtney Welton-Mitchell is a research associate with the Natural Hazards Center in the Institute of Behavioral Science at the University of Colorado Boulder. She is the cofounder and director of the Humanitarian Assistance Applied Research Group at the Josef Korbel School of International Studies at the University of Denver. Her research and consultancy work focuses on global mental health and gender-based violence with an emphasis on forced migration.*



*Andrew Riley is a mental health and human rights consultant working in Southeast Asia. He has worked with the United Nations High Commissioner for Refugees (UNHCR) in Bangladesh and with the Federal Emergency Management Agency Crisis Counseling program in Colorado. He is also the former SalusWorld country coordinator for Myanmar. His work includes research, program design, training, capacity building, and coordination, often working in collaboration with local organizations on behalf of marginalized populations.*

# Acknowledgements

The *Research Counts* series was born out of a desire to share key hazards and disaster research findings with a broader audience and ensure that knowledge is available to those who need it most. Therefore, the pieces in the series are brief and written to be used by a wide range of practitioners, policy makers, and emerging researchers.

The format of this series means that researchers—who are often used to writing much longer journal articles—have to condense their ideas and findings down to the 750-word mark. We are grateful to all of the authors in this series for their dedication and patience as we worked with them to craft these pieces into publications that are accessible and easy to read. Their insights are invaluable and will make an enduring difference.

We are also grateful for the support that made the vision for this series a reality. In particular, we acknowledge funding from the National Science Foundation (CMMI-1635593). This project was also partially supported by Interagency Agency Agreement 16FED1605626 from the U.S. Centers for Disease Control and Prevention and an additional agreement from the U.S. Geological Survey. The contents are solely the responsibility of the authors and do not necessarily reflect the views of the NSF, CDC, or USGS.

Richard Olson and Carolyn Robertson of the Extreme Events Institute and the International Hurricane Research Center at Florida International University generously helped fund the production and printing of the *Research Counts* books.

Russ Paulsen, formerly of the United Way, and Jacqueline Snelling of the Federal Emergency Management Agency, have offered thoughtful feedback on the structure and organization of the series.

If you are interested in contributing to *Research Counts*, please contact Lori Peek and Jolie Breeden at [Lori.Peek@colorado.edu](mailto:Lori.Peek@colorado.edu) and [Jolie.Breeden@colorado.edu](mailto:Jolie.Breeden@colorado.edu).

Thank you for reading *Research Counts*.

Please take a moment to fill out this survey so we can continue to improve this series:  
[hazards.colorado.edu/rcsurvey](https://hazards.colorado.edu/rcsurvey)



Natural Hazards Center  
Institute of Behavioral Science  
University of Colorado Boulder  
1440 15th Street  
Boulder, CO 80309-0483 USA

[hazctr@colorado.edu](mailto:hazctr@colorado.edu) | (303) 492-6818  
[hazards.colorado.edu](http://hazards.colorado.edu) • [hazards.colorado.edu/news/research-counts](http://hazards.colorado.edu/news/research-counts)