



## The All-Hazards Issue



THE MISSION OF THE NATURAL HAZARDS CENTER is to advance and communicate knowledge on hazards mitigation and disaster preparedness, response, and recovery. Using an all-hazards and interdisciplinary framework, the Center fosters information sharing and integration of activities among researchers, practitioners, and policy makers from around the world; supports and conducts research; and provides educational opportunities for the next generation of hazards scholars and professionals. The Natural Hazards Center is funded through a National Science Foundation grant and supplemented by contributions from a consortium of federal agencies and nonprofit organizations dedicated to reducing vulnerability to disasters.

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WELCOME TO the *Observer's* all-hazards issue.

The Natural Hazards Center's mission is to "advance and communicate knowledge on hazards mitigation and disaster preparedness, response, and recovery." In doing so, we use an all-hazards and interdisciplinary framework—meaning our work focuses on emergencies and disasters caused by all threats, whether natural, technological, or human-caused. Our scope, however, hasn't always included all hazards. As the Center's name implies, we once focused more intensively on hazards perceived as acts of nature.

To understand how we have progressed to this all-hazards framework over the years, it is helpful to look at our history. The Natural Hazards Center concept originated from a research project carried out in the early 1970s by geographers, sociologists, and other social scientists at the University of Colorado Boulder. This project, which was led by Gilbert White, involved an extensive analysis of the state of natural hazards research in the United States and had two aims. One was "to provide a more balanced and comprehensive basis for spending taxpayer dollars on hazard reduction programs." The second was "to be more systematic in identifying research needs related to hazards" (Myers, 1993: 42-43).

While working on what would become the first Assessment of Research on Natural Hazards, this group of social scientists soon realized that the people responsible for hazards management and emergency response did not regularly communicate with those carrying out hazards and disaster research and vice versa. This lack of communication prompted White and his coauthor, Eugene Haas, to include a recommendation for the creation of a natural hazards clearinghouse as part of the assessment.

A year after the publication of the first assessment, White formed the Natural Hazards Research and Applications Information Center. Central to his initiative was—and still is—its clearing house activities. Today these

activities include the publication and distribution of the *Natural Hazards Observer*, *Disaster Research*, the curation of a large library and Web site, and the organization of the annual Workshop. By creating a clearinghouse, White and his team of graduate students and professional staff hoped to efficiently distribute information on hazards and disasters to scholars, citizens, practitioners, and policy makers; but also to connect these individuals to one another.

While the initial research project focused on natural hazards, the Center has long focused on disasters that can't be attributed to nature. For instance, White—who was a prominent geographer known for his work in flooding and water management—also studied technological hazards, such as dam and levee failures. Under the leadership of Dennis Mileti, a sociologist and Natural Hazards Center director from 1994 to 2003, the scope of the Center widened further. The focal point became the societal aspects of both natural and technological disasters. Social scientists like Mileti have long argued that the agent of an event—whether natural or technological—matter less than its implications on human populations.

The terrorist attacks on September 11, 2001, resulted in the creation of the Department of Homeland Security and led to the reorganization of the Federal Emergency Management Agency under the purview of DHS. This, in some ways, further blurred the lines between natural, technological, and terrorist threats; and again shifted the focus of the Center's work.

The Hazards Center has remained responsive to disaster developments, as well as governmental reorganization and prioritization in terms of various hazards and threats. Today we provide information that furthers understanding about preparedness, response, recovery, and resilience for all hazards—natural, technological, biological, environmental, and human-caused. Aside from the social impacts of disaster, the Center also examines the engineering, policy, and public health consequences of events.

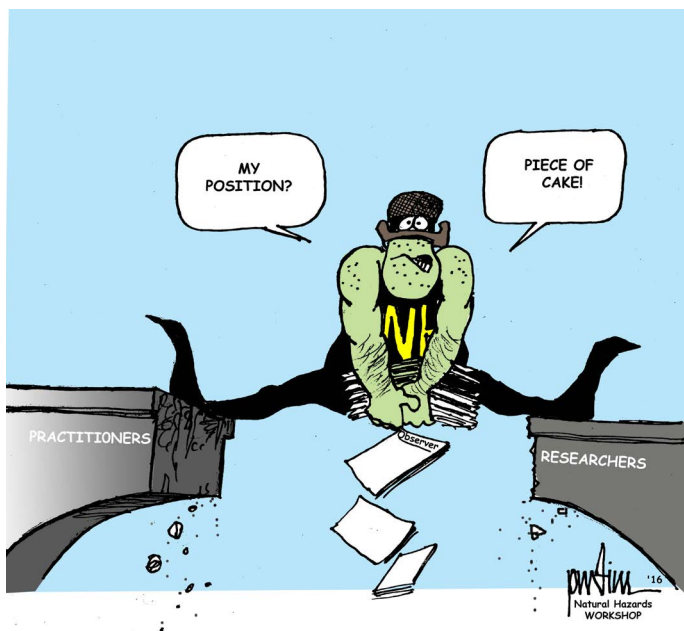
This *Observer* celebrates the breadth of work that now so clearly marks our hazards and disaster research community. Accordingly, this issue includes articles about the willingness of emergency medical service providers to respond during disease outbreaks, public perceptions of Zika, pets and disaster resilience, inmates as emergency responders, earthquakes and oil drilling in the Los Angeles area, and the amazing story of one of Hurricane Katrina's many heroes, Kenny Bellau. Additionally, Kathleen Tierney reflects on her time as director over the past 13 years, while incoming director, Lori Peek, speaks to the Center's mission and future.

I hope you'll enjoy this *Observer*, and I hope you will join me in thanking our past director and enthusiastically welcoming our next.

*Elke Weesjes, Editor*

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## all creatures Great and small Improving Disaster Resilience Through Pets

*By Kyrilly Thompson and Danielle Every*

Evacuees, some with pets, and patients arrive at New Orleans airport where FEMA's Disaster Medical Assistance Team have set up operations.  
© Michael Rieger/FEMA, 2005, New Orleans, Louisiana.

HUMANS FORM strong attachments to their pets and other animals. So much so, that they are willing to risk their own lives to save those of animals. This is especially true during natural disasters (Heath, Voeks, and Glickman 2001; Heath et al. 2001). There are myriad examples where people have jumped into raging floodwaters to save their dog, cow, or horse from drowning, or refused to evacuate if it meant leaving their beloved cat behind. Because of this willingness to risk one's life, disaster researchers tend to characterize pet and animal ownership as a risk factor for human survival. While this characterization is fair, we argue that animal ownership and animal activities could also provide successful avenues for disseminating natural hazard information and engaging people, especially the vulnerable, in strategies designed to increase disaster resilience.

### **Animals in the lives of vulnerable people**

Many who work in the disaster field know that resilience is not evenly distributed across the community, leaving some groups more vulnerable than others. The Aus-

tralian National Strategy for Disaster Resilience (Council of Australian Governments 2011), for example, warns that the level of exposure to hazard risk, understanding of risk, and ability to respond and recover from hazards vary across the board. Poverty, remoteness, mobility, age, and speaking English as a second language are all factors that play a role in an individual's vulnerability to hazards.

In Australia five groups are commonly described as 'vulnerable': Indigenous Australians, culturally and linguistically diverse communities (CALD), children and youth, the elderly, and people with disabilities (Standing Council on Police and Emergency Management 2013). Two other groups also deserve consideration: the homeless and people experiencing mental health issues. Engaging these vulnerable groups in hazard resilience is no easy task. Difficulties range from access to relevant information using language and visuals that resonate with different groups, to people's motivation to prepare. For many vulnerable people, natural disasters are a potentially distant future threat, much less concrete and urgent than the immediate financial, social and psychological crises that they face on a daily basis. There is a need to explore different approaches





Horse owner, Chloe Dibley, exercises her horses at the temporary animal evacuee shelter at the Del Mar, California, race track. She evacuated 50 horses from the Poway area during the fires. Andrea Booher/FEMA, 2007, California.



Members of the Missouri Emergency Response Service team, a non-profit that does large animal rescues, launch a boat to take part in a large animal rescue along with the Humane Society to rescue 13 cattle that were stuck in flood waters. Jocelyn Augustino/FEMA, 2008, Missouri



Birds displaced by Hurricane Ike are at a local shelter set up by the Humane Society where volunteers from around the country are helping to rescue animals displaced by the hurricane. © Jocelyn Augustino/FEMA, 2008, Galveston Island Texas.



Dogs found in areas impacted by Hurricane Katrina are placed in carriers to be brought to a main location by the humane society. The FEMA Veterinary Medical Assistance Teams are helping out. © Jocelyn Augustino/FEMA, 2005,

to engaging all people in disaster-resilience strategies that overcome these barriers and inequalities. Capitalizing on people's desire to save pets and animals is one such approach.

Pets and animals are important to vulnerable people for practical and personal reasons. For indigenous communities, animals are integral to people's cultural and spiritual practices (Constable et al. 2010). For children and for elderly people pets are best friends, confidantes, and sources of comfort and protection (Kaminski et al. 2002; Enders-Slegers 2000). They may also serve as practical aides for people with autism, physical and psychological disabilities (e.g. as a seeing eye dog). And socially, pets help people feel less isolated and increase their sense of connectedness and meaningfulness (Winefield et al., 2008). Disability-assistance animals reduce tension, anxiety and depression and improve social involvement and independence (Lane et al. 1998; Kwong & Bartholomew, 2011). For the homeless, companion animals reduce loneliness and improve physical and mental health, as well as self-esteem (Irvine 2013a & b).

## Disaster context

Pets and animals impact the emergency behavior and disaster resilience of those vulnerable people who own or care for them, particularly around evacuation behavior. Vulnerable people rely heavily on evacuation shelters during a disaster. For example, a case study of a flood in Australia (Every 2016) found that evacuation shelters were almost exclusively used by people sleeping rough, people living in precarious accommodations like caravan parks, people in elderly care facilities, and people suffering from mental illness and disability. Locating, transporting and housing pets for evacuation was a source of great anxiety because people who couldn't afford harnesses and carrier containers couldn't take their pets with them and were forced to leave them behind. Others were supported by the Royal Society for the Prevention of Cruelty to Animals (RSPCA) who housed their pets for the duration of the disaster. Being separated from loved animals was a source of deep angst and sorrow for months after the flooding (Every 2016), further compounding the trauma of the event.





Survivors of Hurricane Katrina arrive at New Orleans Airport where FEMA's Disaster Medical teams have set up a medical hospital and where people will be flown to shelters in other states. © Michael Rieger/FEMA, 2004, New Orleans, Louisiana



The Southern California wildfires missed the home of this Rancho Bernardo woman and her family who evacuated to Qualcomm Stadium and are now "just waiting to get back in." © Michael Raphael/FEMA, 2007, San Diego, California



This cat is a West Virginia flood survivor whose pre-disaster owner can no longer keep him. He will become an adoptable pet. FEMA's pet care task force worked closely with many voluntary agencies to assure pets were rescued and well cared for and, when possible reunited with their families. © Steve Zumwalt/FEMA, 2016, Charleston, West Virginia



Donated cattle feed is going into a feed hopper and will help feed the 650 head of cattle owned by Mark and Steve Trahan which survived Hurricane Rita's winds and waters. Some 15 area Ranchers are still working to rescue several thousand cattle now lost in the flooded marshes of lower Cameron Parish. Win Henderson / FEMA Photo by Win Henderson, Oct 02, 2005, Hackberry, Louisiana

Because of the many benefits that animals have offered to people in disasters, particularly vulnerable populations, animals should be incorporated into hazard management and emergency planning in all regions. People's relationships with their pets, and the animal-related networks and activities among pet owner are underexplored devices for disseminating disaster information and engaging people in disaster preparedness.

We now explore what this might look like.

### Building disaster resilience

Animal-related activities could facilitate distributing disaster information more widely.

Material designed to build disaster resilience could be distributed to vulnerable people who have pets through

animal-related activities and networks. These might include assistance-animal organizations, such as Assistance Dogs Australia, equine therapy groups, and programs that provide pet health clinics and free veterinary services for people experiencing homelessness. These kinds of organisations could reach audiences who may otherwise not be exposed to disaster-resilience information. The programs may also provide a non-threatening environment and be seen as trustworthy sources of information for vulnerable people who may be suspicious of assistance.

*Animals could facilitate better communication with vulnerable groups.*

Using the point of contact with people's existing animal networks allows for information to be delivered visual-



Damage to homes and property in Lower 9th Ward due to Hurricane Katrina. Markings on house were from the Search and Rescue teams searching for survivors following the storm - the date searched, time, who the search party was, survivors found and animals still in the house."  
 © Andrea Booher / FEMA, 2005, New Orleans, Louisiana.

ly, face-to-face, in settings where people feel comfortable. This is especially important for people who are fearful or anxious, who have had bad experiences with authorities, or who simply may prefer visual or verbal communication.

*Animals could improve motivation for vulnerable people to prepare and act.*

People who are more vulnerable to disaster risk are most often using all of their physical, psychological and financial resources to face daily challenges. Natural-disaster preparedness, understandably, is not people's first priority. However, one way to help people to understand the importance of preparedness for themselves is to help them see how important it is for their animals to be prepared-

## Pets and Disasters in the United States

BY ELKE WEESJES

The debate about what to do with animals during disasters in the United States didn't really start until after Hurricane Katrina. When the devastating 2005 disaster occurred, there were no laws requiring pets be evacuated or sheltered in an emergency. This lack of provision for pets put human health and safety in jeopardy when many pet owners chose to ride out the storm at home rather than leave their animals behind.

Other people took their pets with them only to find out that animals were barred from emergency transport and shelters. One of these pet owners was a nine-year-old boy who was forced to surrender his dog Snowball as he boarded a bus out of New Orleans at the Louisiana Superdome. According to *Associated Press* reporter Mary Foster, the little boy cried out repeatedly for his dog and got so upset that he vomited in distress (Dawn, 2005).

Tragically, Snowball was never found again, however, the story did motivate Rep. Tom Lantos (D-Calif.) to propose the federal Pets Evacuation and Transportation Standards (PETS) Act, citing a picture of the boy being separated from his dog as the act's catalyst (U.S. Congress 2006).

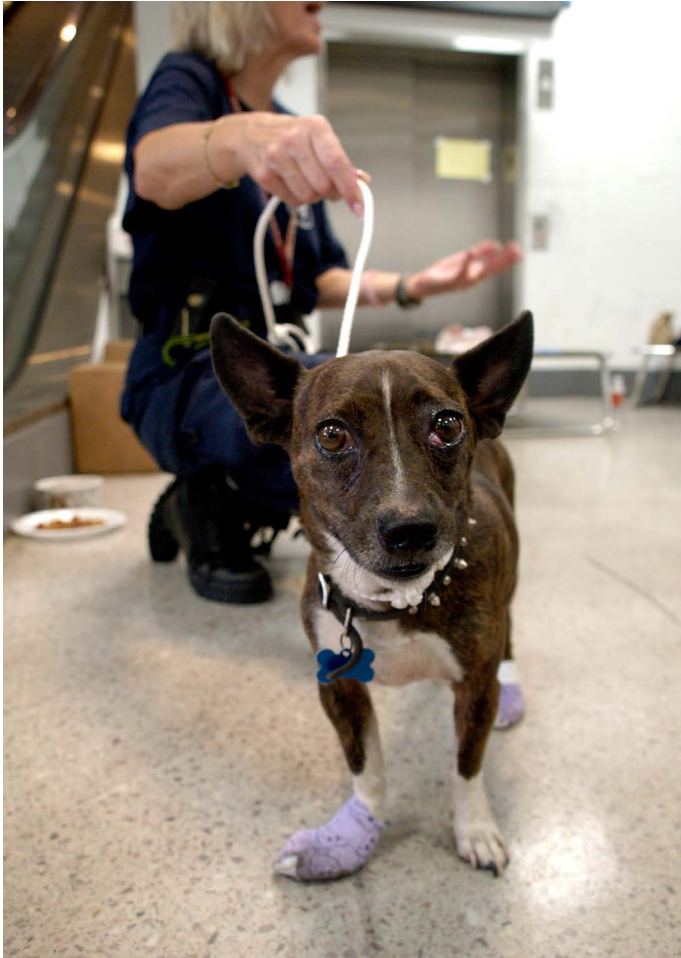
PETS, technically an amendment to the Stafford Act, was signed into law by President George Bush on October 6, 2006. It required states seeking Federal Emergency Management Agency assistance to accommodate pets and service animals in their plans for evacuating residents facing disasters.

Since then, more than 30 states have either adopted laws addressing pets in disaster planning or implemented administrative plans on the subject. Many state laws require that animals be sheltered and evacuated during an emergency. Such plans establish procedures to coordinate federal, state, and local government agencies; volunteer organizations; animal interest groups; and veterinary personnel to rapidly respond to natural disasters that affect the health, safety, and welfare of people and animals. While these plans differ from state to state, most address several key elements, which include the care of companion animals, the implementation of state animal response teams, the sheltering of animals, and the identification of recovered animals (Hodges, 2011).

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A lost pet receives care from the V-MAT at New Orleans airport where FEMA's Veterinary Medical Assistance Teams have set up operations. © Michael Rieger/ FEMA, 2005, New Orleans, Louisiana

Communicating the potential consequences of natural disasters on animals, together with information on how to easily reduce risk, could be an effective motivator for people to become more prepared.

*Animals could facilitate the provision of material support to help people prepare.*

Distributing free leads and carrier cases, providing free micro-chipping and vaccination services, for example, can help people explain how these things can improve natural-disaster preparedness. Agencies such as the World Society for the Protection of Animals and the RSPCA would make ideal points of contact for also talking to people about where they could take their animals during an emergency, and how organizations can help house pets.

*Animals could facilitate better recovery for vulnerable people.*

Vulnerable people often face additional challenges during recovery from a hazard, due to their social and cultural isolation, mental health, developmental stresses (in the case of children) and age-related conditions. Pets and other animals provide assistance for these challenges in daily life and so could be even more important following a disaster or emergency. Therefore, helping to keep people

and their animals together is an important part of post-disaster recovery.

## Implications and Conclusion

Animal attachment and animal-related activities and networks could be useful conduits for successfully engaging vulnerable people, communicating resilience-building information to vulnerable people, motivating them to make disaster preparations, providing material support and facilitating recovery. Existing points of contact in animal-related networks, such as vet clinics or assistance animal organizations, can be used as a trusted place to distribute disaster-resilience information. Providing material supports which can help people manage and transport animals, even simple supports like a collar and lead, can also be a way to introduce disaster-resilience information. However, one significant limitation of these kinds of immediate supports is that they do not address the wider political and social barriers to responding safely to disasters as a pet owner. As noted, although evacuation shelters are invaluable for the safety and security of vulnerable people, many of them do not accommodate pets. Changing the design and capacity of emergency shelters to allow people and their pets to remain together would be an important way to improve the experience of vulnerable pet owners. Pet ownership can be a life saver in a policy and planning environment where pet owners receive support to care for their pets at all stages of the disaster cycle,

## Acknowledgments

*This paper is an abridged and adapted version of a paper published elsewhere (Thompson K, Every D, Rainbird S, Cornell V, Smith, B and Trigg, J. 'No Pet or Their Person Left Behind: Increasing the Disaster Resilience of Vulnerable Groups through Animal Attachment, Activities and Networks'. Animals 2014; 4:214-240). The authors of this paper would like to give special thanks to Victoria Cornell, Bradley Smith and Joshua Trigg for their thorough feedback on this paper. The World Society for the Protection of Animals (now known as World Animal Protection) commissioned the original research. We extend special thanks to Jacqueline Mills, Senior Advisor, Corporate Engagement, Asia Pacific, World Society for the Protection of Animals for her trust, support and expert advice.*

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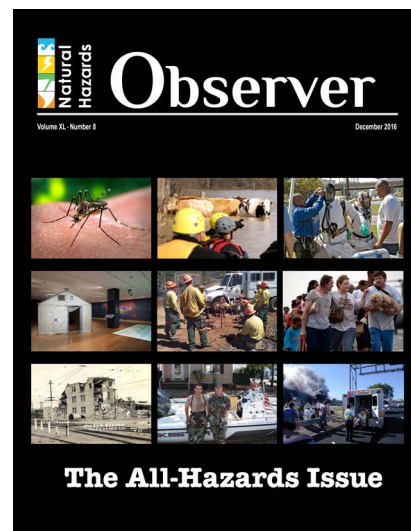
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## Call for Submissions

The *Observer* invites readers to submit items of interest for publication in upcoming issues. The *Observer* is undergoing a makeover and many more exciting changes are in the pipeline. Throughout this process we would love to hear from you. All comments and suggestions are welcome.

Our mission is to close the gap between scientists, policy makers, and practitioners by providing coverage of disaster issues, recent disaster management and education programs, hazards research, political and policy developments, resources and Web sites, upcoming conferences, and recent publications. We are looking for papers and field reports that help narrow the aforementioned divide. In addition we are looking for book reviews that contribute to the debates and discussions in the field of disaster research.

**The deadline for the next issue of the *Observer* is January 25, 2016.**

Please send items of interest to  
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# INMATES: OUR DEFENDERS IN DISASTER

By Carlee Smith

Inmate fire crew from South Fork Forest Camp receives a briefing, 2013. © Nathan Seable, Oregon Department of Forestry.

WHEN WE THINK of prisoner labor we generally might imagine inmates picking up highway trash or manufacturing license plates. A less well-known fact is that inmates also assist the public in times of disaster by serving as emergency responders. The experiences of inmates remain isolated from the general public, so it's no wonder that few people know about the role of inmate labor in disasters, or the possible impacts such services may have on incarcerated populations or the general public. In response to this gap in understanding of this practice, I dedicated my master's thesis research to the role of inmate labor involved with emergency management plans across states in the United States.

Ultimately, I found that inmates are included as a labor resource in emergency planning in a majority of states across the nation and could be taxed with providing a large variety of services vital to emergency response. Additionally, I found that how emergency-planning documents categorize and perceive inmates varies, and this variation could present challenges for both inmate and emergency-management populations. Inmates are not only identified as a labor resource in emergency-management planning documents. They are also identified as a hazardous population

that poses an additional risk to the public, as well as a vulnerable population that requires additional protections to ensure their safety during a disaster. My research raises numerous questions about how the perception of inmates by emergency management affects the inmates' experiences during a disaster, their safety and well-being, and how the public acknowledges—or ignores—the connection between “hero” and “prisoner.”

## Inmate populations in emergency planning

In the United States, more than 2.2 million people are currently incarcerated. Most of them are often considered socially vulnerable by disaster scholars—namely, low-income, less educated men who are disproportionately racial minorities. This enormous population of people behind bars provides a cheap labor source for many industries and enterprises. The use of inmates for free or cheap labor has a long history in the United States. Most notably, the 13th amendment to the U.S. Constitution allows for the forced labor of any persons convicted of a crime. The intent of the amendment was to make slavery illegal after



the Civil War, but prisoners were exempt from this policy. This amendment was and continues to be used to provide a large, expendable, and cheap labor force in various industries, including emergency management.

There is no widely available data on inmate labor during disasters. Thus, I examined state-level emergency management plans to understand how these documents, which lay out the coordination of various public and private entities roles in disaster response, discuss inmates. I had planning documents from 47 states, 64 percent of which explicitly identify inmate labor as a resource for response and recovery activities (Smith 2016). These figures are likely an undercount because states are not required to disclose whether or not they use inmate labor in emergency situations. It is unclear how long this practice has occurred. Emergency management within the field of corrections have noted that with a growing emphasis on detailed and comprehensive emergency planning, it is becoming more common for departments to fully recognize and document inmates as a potential resource should a disaster occur (Schwartz and Barry 2005).

When examining state emergency-management plans, I found that inmates are described as being responsible for at least 17 different emergency response and recovery tasks (Smith 2016). Some of these tasks are straightforward and reasonably safe, including cleaning up general debris and clearing roads, preparing sandbags to protect communities from flooding, and feeding people in the event of a mass-displacement. Others are much more dangerous, such as fighting wildfires, cleaning up hazardous materials spills, or helping with evacuations.

Beyond what is listed in planning documents, scant research exists on the use of inmates in disaster, their training, the safety mechanisms for them or for the public, and whether the labor is voluntary, for instance. Anecdotally, we have seen examples in states like California where inmates comprise nearly 40 percent of the state's wildfire-response force. In addition to wildfire operations, inmates have responded to earthquakes, hazardous materials spills, major transportation incidents, search and rescues, public health emergencies, flooding, as well as multi-casualty and terrorism incidents throughout states. Because of the expertise and skill level of the inmate strike teams, they often lead the response efforts for more than 350,000 total emergencies each year across the state (Brooker 2013).

While California is the most famous, my results show that it is not unique in its practice of using inmate firefighters. My analysis reflected that at least 11 states across the United States include inmate firefighters in their emergency plans (Smith 2016). Other examples include inmates from Alaska receiving disaster assistance training to respond alongside local Community Emergency Response Teams (CERT 2010), and inmates in Louisiana assisting with flood preparation in response to hurricanes or flooding of the Mississippi River (Gaillard and Navizat 2012).

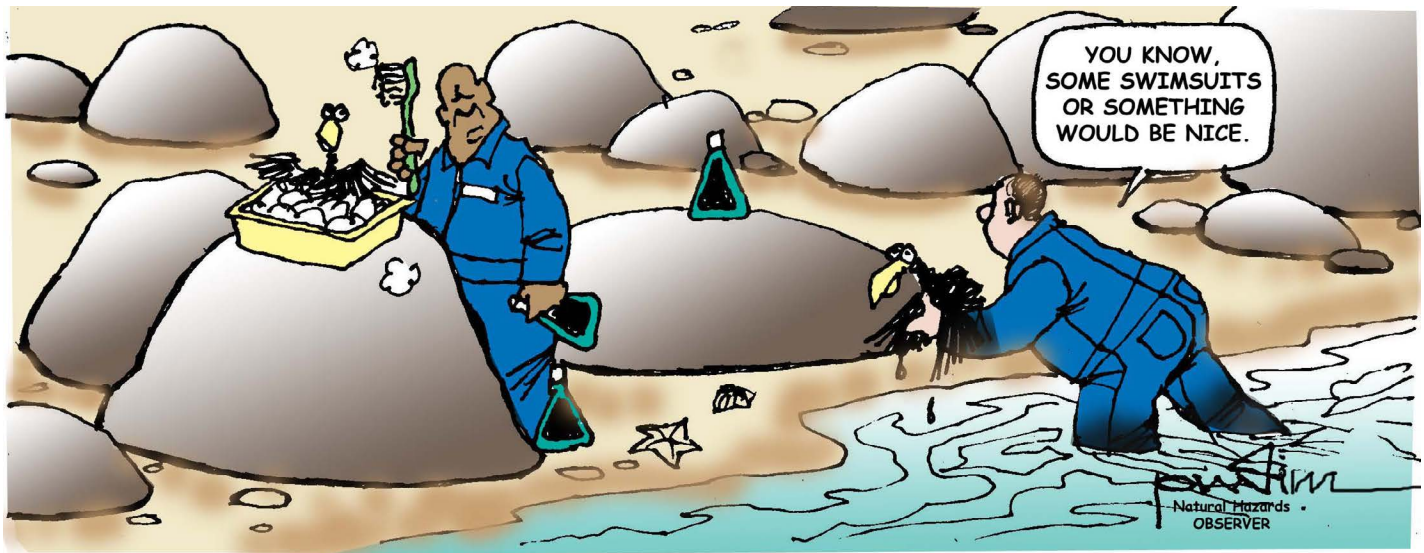
## Questions loom

The practice of using inmates for emergency response raises numerous questions and presents challenges for both emergency management and inmate populations. First, inmates traditionally have represented a hazard within corrections as well as a potential threat to public safety. When inmates are at work within a community, security measures must be in place to prevent escape or any potential crime. Many questions remain as to how emergency management and corrections facilities are addressing these potential risks during a disaster situation.

This perception of inmates as dangerous also places inmates at risk. If inmates are perceived as dangerous they might not be given the resources necessary to survive a disaster. In the wake of Hurricane Katrina deputies fled the coming waters, but the inmates of Orleans Parish Prison (OPP) were deemed to be too dangerous to be let out of their cells, even if it meant the inmates might otherwise die (ACLU 2006). Within my analysis, 54 percent of state level plans referenced the potential danger and added risk posed by inmate populations. Research is needed to understand the implications of these perceptions for safety of the public and inmates.

Other researchers, however, have argued that emergency management should designate inmates as a vulnerable population in the context of a disaster (Robbins 2008; Hoffman 2009; Gaillard and Navizat 2012; Motanya and Valera 2016). Due to the nature of incarceration, inmates must fully rely upon corrections staff for their safety and protection. They are unable to evacuate to safer areas or access life-saving food or medical supplies on their own. Without adequate preparedness and planning, inmates





are at great risk for negative health impacts or even death (Schwartz and Barry 2005). When inmates at the OPP were abandoned by deputies they were left locked in their cells, some in chest-high water contaminated by sewage. Without access to food, water, or medical care, prisoners broke windows and attempted to carve holes in the walls so that they could escape to safety. After days had passed, inmates were finally rescued (ACLU 2006). If inmates are seen as a vulnerable population whose rights and lives are worth protecting, rather than a dangerous population, prison officials and emergency management must extend to them the resources necessary to protect their lives and well-being. Within my analysis, 59 percent of states referenced the vulnerability of inmates in a disaster, but there was limited information on how that vulnerability translates into practice.

This vulnerability is further exacerbated by overcrowding. In 2014, 36 percent of state prison systems were determined to be “over-capacity,” while the national average rate of capacity remained at 98 percent. Facilities across the United States continue to house more inmates than their resources can adequately provide for and safely house (Bureau of Justice Statistics 2015). Overcrowding has been shown to create a dangerous and destructive environment detrimental to the health and safety of inmates (Haney 2006). One strategy to combat over-crowding is to allow inmates to earn an early release in exchange for providing labor for various work programs or projects. Nineteen states across the United States have implemented such programs, three of which (California, Colorado, and Louisiana) increase their rate of earned time credits for labor provided during a disaster (Lawrence 2009).

As such, inmates may be more willing to accept risks to their health and safety to respond to a disaster in hopes of escaping the risks to their health and safety posed by over-burdened and stressed prison facilities. Inmates in Louisiana were given earned time off of their sentences in exchange for helping clean up the 2010 British Petroleum oil spill in the Gulf of Mexico. However, they were given only “flimsy coveralls and gloves” as protectants against the very serious health impacts of crude oil, that’s much less protectant than other workers wore (Thompson 2012: 43). This raises additional questions as to whether or not inmates are given the same caliber of training or resources

to respond to disasters compared to traditional laborers and responders.

As our nation continues to grapple with the legacy of slavery and mass incarceration, the experiences of inmates in disasters are particularly relevant. The practice of inmate emergency response may serve as a reflection of just how entrenched the exploitation of inmate labor is within our society. If we can trust inmate populations to the extent that we rely upon them when we are most vulnerable, in the midst of catastrophe, shouldn’t they receive better care or potentially incur sentences that avoid imprisonment? Or will increasing disaster impacts further entrench and support mass incarceration, especially of less educated and low-income persons, who are often socially vulnerable in disaster situations?

California recently had to grapple with this issue after passing Proposition 47. This ballot initiative passed by California voters in November 2014 reduces the number of low-level, non-violent offenders in the state’s dangerously overcrowded prison system. Controversy ensued once it was understood that this policy would reduce the number of inmates available to combat wildfires. Kamala Harris, the state’s attorney general, said the program “would severely impact fire camp participation—a dangerous outcome while California is in the middle of a difficult fire season and severe drought” (“30 Percent” 2015). While California operates the most visible program relying upon inmate labor in disasters, the practice is common across most states. Although California operates the most visible program relying on inmate labor in disasters, the practice is common in most states. More research is needed to gain a comprehensive understanding of what better emergency management and criminal justice practices would look like.

Furthermore, we should include inmate labor in the costs of disasters, and consider how the use of this cheap labor is subsidizing the rising costs of disasters in the United States. As we work to reevaluate and reform our criminal justice system, the role and experiences of inmates in disasters must also be evaluated. We must assess how the experiences of inmates differs from that of traditional emergency response, and whether or not those differences place incarcerated persons at risk. Comprehensive data is needed to assess whether or not inmates participate vol-



untarily, as opposed to forcibly, across disaster response, what kind of training and resources they are given, as well as what protections are in place to prevent impacts to their health and safety. As public servants and emergency responders—who in any other situation would be considered the heroes of our society—we owe inmates resources and planning to ensure our emergency-management practices are saving lives, not making inmates more vulnerable in disaster.

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For more information contact Wanda Headley at 303.492.5787 or [wanda.headley@colorado.edu](mailto:wanda.headley@colorado.edu).



By Elke Weesjes

EARTHQUAKES caused by oil and gas drilling in Oklahoma and other states are causing a stir these days. But they're not a new phenomenon.

More than a dozen disastrous earthquakes in the Los Angeles area in the early 20th century may have been induced by oil production activities, according to a new study by Susan Hough and Morgan Page of the U.S. Geological Survey. Their findings are especially important because they will likely reshape how seismologists calculate the rate of natural earthquake activity in the Los Angeles basin.

## A Wild West industry

The oil boom in Los Angeles began in 1892 when an oil field, about four miles long and a quarter mile wide, was discovered in the city's Elysian Park neighborhood near the present-day Dodger Stadium. This field is only one of many in the Los Angeles Basin. Others include the Salt Lake and Beverly Hills fields, the Los Angeles Downtown, the Brea-Olinda field, and the Huntington Beach field.

By 1923, these oil fields in the Los Angeles Basin accounted for nearly 20 percent of the world's total production of crude oil (Gorman, 2016). However, retrieval methods to

get the oil out of the ground weren't as evolved as they are today, according to Hough.

"It was kind of more of a Wild West industry back a hundred years ago, and the technology wasn't as sophisticated, she told the *Los Angeles Times*. "People would just pump oil, and in some cases the ground would subside—fairly dramatically" (Rong-Gong Lin II).

In their study, which was published in November in the *Bulletin of the Seismological Society of America*, Hough and Page reviewed state oil drilling reports from the time. The researchers compared industry data, such as drilling permit approvals and well abandonments, to a list of the 22 biggest earthquakes in the period 1900-1935. They found links between earthquakes, including the 1920 Inglewood earthquake, the 1929 Whittier quake, and the 1933 Long Beach quake, and nearby oil production activities that took place around the same time as the tremors occurred (Hough and Page, 2016).

## Long Beach 1933

Of the 13 earthquakes that were likely caused by oil production activities, the 6.4-magnitude tremor that shook Long Beach in 1933 was especially devastating. Between 115 and 120 people died and property damage topped \$40 million (which would amount to \$722 million today).

The authors discovered that this deadly tremor occurred less than nine months after directional drilling<sup>1</sup> in the Huntington Beach oil field—the location of the earthquake's epicenter—first extended into offshore tideland reserves, reaching depths of over 8,000 feet (Hough and Page, 2016).

Hough and Page observed something similar before the 1929 Whittier quake. This 4.7-magnitude tremor occurred about five months after the initial exploitation of production horizons at depths below 6,000 feet.

"And again, if you look at where the production was concentrated ... it was essentially smack on top of where the earthquake was centered," Hough told the *Los Angeles Times* (Rong-Gong Lin II).

Since the timing of most of the earthquakes they studied correspond with times when wells were being significantly deepened, the authors believe that the depth of wells is a key factor. After all, drilling deeper means getting closer to the basement rock, and thus closer to the tectonically active faults (Phys.org, 2016).

In the period after the Long Beach earthquake, drilling methods changed dramatically, which might explain why a study by Hauksson et al. (2015) concluded that there was no significant evidence for induced earthquakes in the Los Angeles area since 1935.

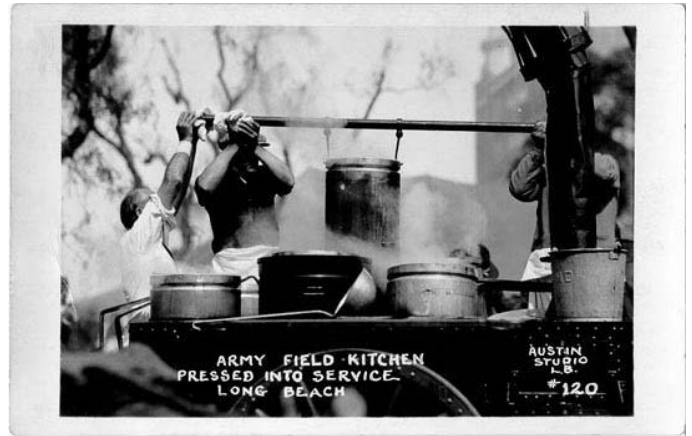
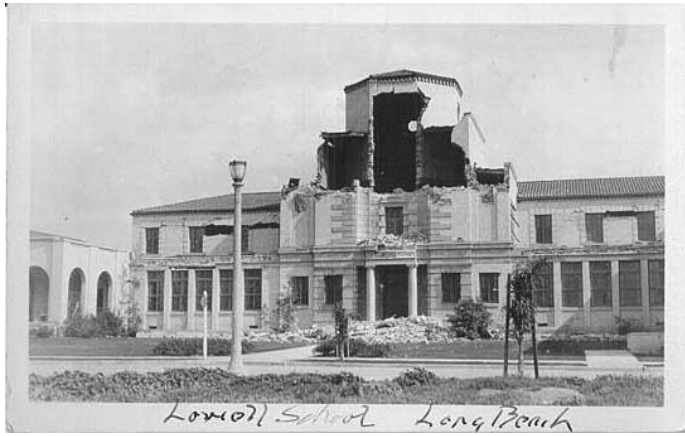
"With the advent of water flooding<sup>2</sup> and other changes in industry practices, you may not find these kinds of induced earthquakes after 1935," Hough told Phys.org. "It's possible it was just an early 20th century phenomenon" (Phys.org, 2016).

Throughout their study, the authors emphasize that the link between oil extraction and seismic events in the Los

<sup>1</sup> Directional drilling is the practice of drilling non-vertical wells

<sup>2</sup> In this method water is injected to replace the pumped-out oil in order to prevent land from sinking while it also helps extract more oil.





Angeles basin does not apply to modern extraction practices, namely hydraulic fracturing, or fracking. Still, their findings are relevant today because they suggest the natural rate of earthquake occurrences in this area may be significantly lower than previously calculated.

“Maybe the L.A. basin as a geological unit is more seismically stable than we’ve estimated,” Hough told *Reuters*.

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# Reporting for Duty During Disease Outbreaks

## *The Views of Emergency Medical Service Providers*

*By Mahmoud Alwidyan*



Members of an area Emergency Medical Technician team undergo training required for certification as rescue (grey suits) and decontamination (green suits) unit responders to hazardous material and toxic contamination situations. Win Henderson / FEMA Photo by Win Henderson, Oct 08, 2005, Baton Rouge, Louisiana.

THE SPANISH FLU pandemic of 1918-1919 infected one third of the world's population and killed an astonishing 50 million people. Since this pandemic, the deadliest in recorded history, several other disease outbreaks have swept through the world, including Severe Acute Respiratory Syndrome (SARS) in 2003 and Ebola in 2014.

Among those who became ill or lost their lives during these more recent disease outbreaks were a disproportionate number of healthcare providers. For instance, 21 percent of SARS victims were healthcare workers, and some of them transmitted the disease to their family members (Smith et al. 2009). Moreover, during the SARS outbreak in Toronto, Canada, 436 (51 percent), of 850 paramedics involved were exposed to SARS and quarantined for 10 days at home or work. Sixty-two of them developed SARS-like illnesses, and four of them were hospitalized (Silverman, Simor, and Loutfy 2004). When it comes to Ebola, a recent report from the World Health Organization shows that healthcare workers are 21 to 32 times more likely to be infected with Ebola than people from the general population (WHO 2015). This report also shows that about two-thirds of infected healthcare workers died. These recent outbreaks of Ebola and SARS have brought renewed attention to a dilemma that medical professionals face: Should they respond to disease outbreaks if this means risking their own and their family's health?

It is generally recognized that healthcare workers are willing to prioritize patient needs over their personal needs, interests, and safety, especially during disasters. When it comes to disease outbreaks, however, this isn't always the case. In fact, research studies show that, except for radiation disasters, healthcare workers are the least willing to work during epidemics (Qureshi et al. 2005). Safety of family and self, uncertainty, and a lack of confidence in an employers' response to a disease outbreak are all associated with unwillingness to report for duty during such events (Ives et al. 2009; Devnani 2012). Yet these fac-

tors are not well elucidated in the literature and they need further investigation (Devnani 2012).

Additionally, research studies that assess healthcare workers' ability and willingness to report for duty during disasters and public health emergencies focus mainly on physicians, nurses and hospital administrators (Damery et al. 2010). Little research has been conducted on emergency medical service (EMS) providers, despite the fact they are an essential component of the larger healthcare system (Watt et al. 2010). In response to this need for further research, I decided to document and examine EMS providers' views about working during disease outbreaks compared with during natural disasters, and to discuss the main factors that may influence their decision to keep working during such situations.

### **What is EMS?**

EMS is a system that provides out-of-hospital care for patients with urgent needs. EMS personnel are trained to rescue medical and trauma patients, provide them with emergency care, and transport them to the appropriate care facilities. While there are different levels of certifications and licensing, emergency medical technicians (EMTs) and paramedics are the most common EMS providers, with paramedics being the ones with highest level of training and licensing (NREMT 2015). The organizational structure of EMS varies considerably across the country. Pre-hospital services can be based in a hospital, a fire department, an independent government agency, a nonprofit corporation (such as a Rescue Squad) or be provided for by commercial for-profit companies. (NREMT 2015; NHTSA 2014).

The EMS system is in many ways both similar to and different from the larger healthcare system. Compared with their counterparts in hospitals, EMS providers have a different level of education and training, they have a different



work culture and structure, and they work in different and less controlled work environments. Also, since they work in the field, EMS providers are often the first point of contact a person has with the system during an emergency. Therefore, more research is needed that addresses EMS, particularly how its providers report to duty during outbreaks of infectious diseases.

## Will EMS providers show up during disease outbreaks?

As I already noted, research studies focusing on EMS reporting for duty during disasters and public health emergencies are scarce. Smith, Burkle, and Archer (2011) assessed the risk perception among Australian paramedics toward different hazards. From the 40 most common disaster scenarios that the authors developed, they found that paramedics ranked nuclear and radiological events and outbreaks of new and highly contagious disease highest for fear and unfamiliarity. In another study, which assessed the willingness of EMS personnel to report for duty during disease outbreaks, Barnett et al. (2010) found that 93 percent of EMS personnel would be willing to report for duty if required. The willingness falls, however, to 48 percent if there is a possibility of disease transmission to a family member. A similar study by Mackler, Wilkerson, and Cinti (2007) found that 91 percent of the respondents would remain on duty if they had been vaccinated and ensured that they were protected from infection. This percentage, however, falls to 38 percent if their families have not received the vaccine, and to only 4 percent if neither vaccine nor protective gear are available.

These research studies underscore that the decision to report for duty during disease outbreaks is highly influenced by many factors, enough to cause EMS workers' intention to come to work to plunge—from 91 percent to 4 percent. I was surprised that in-depth qualitative studies have not been conducted in the United States. In my research, I have applied a mixed qualitative and quantitative approach to more fully understand this issue. In the qualitative phase of the study, I performed 13 interviews with EMTs and paramedics in the state of Delaware to explore their insights and views about working during both natural disasters and disease outbreaks. I explored the factors that may influence their decision to work or not work during disease outbreaks. The findings of the face-to-face interviews were also used to develop a questionnaire to conduct the second phase of the study, which is in development as this article goes to press.

In this article I offer a preview of the perspectives that EMS providers shared when asked about how working during disease outbreaks compares with working during natural disasters. As was the case in prior studies of other healthcare providers, many factors influence EMS providers' decisions. Family obligations, workplace culture and organization, training and skills, severity of the disease, and confidence in the employer' capabilities to respond accurately to an event are the main factors that I discussed in the interviews. I chose to focus on the views of EMS providers about their confidence in their employer; to me these are the most significant and interesting factors. Work on other factors is ongoing and will be presented in future publications and my doctoral dissertation.

## Responding to natural disasters vs. disease outbreaks: Is there a difference?

During disasters and public health emergencies, EMS providers are among the frontline first responders to step up and provide service. EMS providers receive intense training in responding to disasters using the Incident Command System (ICS). They are trained to provide emergency care, triage, and search-and-rescue operations depending on the type of the disaster. However, during disasters not everybody is able and willing to come to work and provide service. In case natural disasters, Connor (2014) found that between 83 percent and 90 percent of healthcare providers are willing to respond. There may be some providers who are unable to come to work due to personal injuries or transportation problems caused by the disaster. These are considered barriers for ability, as opposed to barriers for willingness to report for duty.

### Natural disasters: thrill seeking

When I asked participants to express their views about working during natural disasters compared with their day-to-day operations, different views and insights emerged. Some said that they have no problems with responding to natural disasters and that they are well trained to work in such situations. Some participants even considered responding to such disasters as the exciting part of their job.

*"The huge disaster or terrorist threat that can happen, that is the exciting [part] of the job...it keeps me motivated because this is something that I [was] trained to do. This is ideally what I want to do."*

*"Like adrenaline junkies...[EMTs] like the excitement... they want to be there, everybody wants to be there to get that thrill."*

*"I think [responding to natural disasters] is little more interesting. It's just a little bit different than what we do every day."*

Curiously, the respondents' emphasis on excitement was not found in previous studies on healthcare providers. To understand this attitude, it is important to know the routine work of EMS providers. In day-to-day operations, the majority of the EMS calls are non-emergency, or non-life threatening calls, meaning that patients need minimal care and transport to the appropriate care facilities (Goldstein 2014). To some extent, this type of work is routine and boring to providers. EMS providers prefer to provide care for acute cases of sick and injured victims, which is the kind of work that they like and are trained to do. This may explain why participants described responding during and after natural disasters as the exciting part of their job.

Other participants didn't share the same enthusiasm to respond during disasters. They voiced concerns about their safety and the safety of their families. It is the unknown-type situations and the lack of experience that concern providers. However, these concerns did not keep them from doing their jobs. This feedback is congruent with a previous study done on EMS in Australia. In this study, Smith et al. (2009) interviewed paramedics in Australia and found that even though paramedics were concerned about working during disasters, they were ada-



ment about fulfilling their professional responsibilities.

A third group of my participants noted that EMS providers find themselves in unsafe situations virtually on a daily basis. For instance, an EMS provider could be dispatched to a routine call and ended up in an active shooting scene. As such they felt that there are no real differences between working in day-to-day operations and working during natural disasters.

*"[Responding during] disaster isn't any different than anything else. It is just the number of people you have in the bad day."*

### Disease outbreaks: a little more concerning

When it comes to stress and concern while working during disease outbreaks, participants expressed two views. The first group was more concerned about working during disease outbreaks when compared with normal conditions or natural disasters. Participants who consider working during disease outbreaks as a concern, mentioned the following:

*"[EMS providers] could potentially spread [disease] to innocents who are not involved in the situation...So there is some anxiety that comes with that."*

*"Natural disasters...we can't really prevent them, you know, they just happen and you deal with it. Disease outbreak—I think a lot of people have a lot of fear, and it's a lot of uneducated fear, ...people don't know about it as much, and the less educated they are, the more panicky."*

*"With an outbreak, if you don't completely understand what is causing it, how [a disease] is transferred, or what's even going on, then that's where the hesitation probably comes in with EMS people."*

*"In disease outbreaks, I think a lot of us are worried about taking it back home to the families."*

Other participants did not see working during disease outbreaks as a concern. This group considered the risk of working during disease outbreaks the same as working in day-to-day operations as long as the EMS provider is aware of the risk and equipped with the appropriate protective gear.

*"It is no different dealing with just a sick person today than it is dealing with someone during disease outbreak."*

*"I will not say people are still excited to come, but when it comes to something like that, I mean EMS providers, we are going to [listen to] the warnings, and prepare with any type of protective equipment, gear, we need to carry, and that is all that we need to do about it."*

*"If I come across somebody [who exhibits] all the signs and symptoms of Ebola, I'm turning [this patient] over to somebody else to take care of that."*

While participants expressed varying concerns about working during pandemic conditions, everyone from both groups felt willing and obligated to come to work despite the perceived high risk for some of them. Yet, they were not "excited" to report for duty. Rather, they used less energetic statements like:

*"It is kind of your job to continue, even though there is an outbreak."*

*"This is what I chose to do, knowing the risk associated with it."*

*"I will not wake up in the morning excited to come to work."*

This view contradicts Smith et al. (2009), who found that paramedics were less willing to work in non-conventional disasters like pandemics, mainly due to the unpredictable and invisible nature of such outbreaks.





A HAZMAT instructor (left) adjusts the respirator mask being used by one of two area emergency medical technician team members who are preparing to respond to a simulated rescue operation to a chemical spill. © Win Henderson / FEMA, 2005 Baton Rouge, Louisiana

## Confidence in employer

EMS workers' confidence in their employer to respond adequately to a disease outbreak and provide them with all the necessary information also seemed to have a significant effect on their decisions whether to come to work or not. Lack of such confidence was associated with less willingness to work during disasters (Trainor and Barsky 2011). Research shows that healthcare employers who adopt risk-mitigation strategies in the workplace increase their workers' willingness to take some risk as part of their duty to work (Draper et al. 2008; Ives et al. 2009). Namely, healthcare workers might be "willing to take necessary risks, but not unnecessary risks" (Damery et al. 2010). Given that pandemics are associated with a high level of uncertainty in the early stages, employers need to communicate with emergency workers about the emergency plan in place: what is known, what is unknown, and what is expected of workers (Ives et al. 2009).

Communication with workers and keeping them abreast of the available information about the evolving outbreak as it unfolds can potentiate workers' trust in their employer. However, a study by the Australian Centre for Prehospital Research (2008) found that about two-thirds of the ambulance personnel reported low confidence in their employer. Additionally, Ives et al. (2009), who conducted focus group sessions with doctors and nurses, found that "lack of information was a key theme across all groups". In the aforementioned study by Smith et al. (2009) paramedic participants reported a lack of confidence in their employer with regard to receiving accurate information about an emerging infectious disease. These participants believed that their employer may downplay the situation by providing inaccurate or incomplete information. Paramedics mentioned that "they would seek information from outside of the ambulance services before making their personal risk assessments."

When I asked participants if they trust their employer to share accurate and the most up-to-date information about

a disease outbreak, their views contradict with the above studies. Participants indicated that they do indeed trust their employers not to withhold anything that is pertinent to their work safety. They also believed that employers will share information promptly when they receive it, although a few had some reservations if employers would have access to the most accurate information.

*"I think for the most part my employer has my best interest in mind. I think they will give me the best information they have. It is whether or not they've done enough to get the best information, and whether or not the information that has [been] related to them is the best information. But I don't believe they will withhold anything from me intentionally".*

Senior EMTs and paramedics who hold administrative roles that were interviewed confirmed that they always pass whatever information they have down to frontline workers immediately. They stated that hiding information would not do the employer nor the workers any good, given that the truth will come out through the media.

When I asked participants if they look for external resources of information to verify the information they obtain from their employers, all participants said yes. However, they explained that looking for external resources of information does not necessarily signal mistrust. Rather, they do so in order to obtain more information about the disease outbreak. Some of them said they believe it is their duty to learn more about a disease, since it enables them to be better prepared.

## Conclusion

Emergency managers, public health officials, and EMS administrators are always concerned about how disease outbreaks can affect a community. EMS providers are among the first responders to step up and help in containing such outbreaks. In this article I discussed their views about working in such situations. Unlike findings of other

studies from outside of the United States, I found that EMS providers in this country seem to be more than willing to report for duty when there is a disease outbreak, though they are much more excited to work during natural disasters.

These views of EMS providers can put emergency managers, public health officials, and EMS administrators at ease. However, it is difficult to draw a conclusion about the real behavior of EMS providers during disease outbreaks using perception studies (Trainor and Barsky 2011). EMS providers in the state of Delaware, and generally in the United States, have not experienced real epidemics during their career. Although some of them witnessed the 2009 swine flu, this outbreak was not severe in terms of virulence and mortality rate, and in turn, it did not scare healthcare providers, particularly EMS personnel. Therefore, we cannot predict their behavior until such crisis occurs.

Given that EMS providers will look for external resources of information should a disease outbreak occur, it is better that employers provide the most up-to-date information to workers on the frontlines and educate them about reliable resources and where to find them. In other words, when employers disseminate information to the frontline workers, it is recommended that they point workers who like to get more information into the right direction in terms of reliable resources (such as the Centers for Disease Control and Prevention's official website). By doing this they can strengthen the bonds of trust between employer and employee.

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# AWARENESS ISN'T KNOWLEDGE

*A Look at How the U.S. Public Perceives Zika*

*A report by David Abramson and Rachael Piltch-Loeb*

Aedes Aegypti © Centers for Disease Control and Prevention

*The New York University Program on Population Impact, Recovery, and Resilience has recently released an eye-opening report on the public perceptions of Zika, a mosquito-borne virus present in more than 50 countries worldwide. A key takeaway from the report is that while a large majority of the U.S. public is aware of the virus, fewer than half understand how the virus is transmitted, that most people who contract the virus are asymptomatic, and that the virus can cause birth defects. As Zika continues to spread throughout Puerto Rico and the continental United States it is vital that public health officials understand how much residents know about the potential dangers of Zika infection. The study's authors, David Abramson and Rachael Piltch Loeb, have generously allowed an abbreviated version of the report to be reprinted here.*

THE PUBLIC HEALTH SECTOR is presently on high alert for evidence of local transmission of the Zika virus in the United States as well as infections that have been acquired. A number of national, state, and local health officials are actively engaged in vector control, surveillance, and diagnostic and communication activities focused on the virus. Even if major outbreaks do not materialize, public health officials are concerned about the possibility of a sharp increase in babies with congenital birth defects and other neurological deficits linked to Zika in pregnant women.

This high level of situational awareness and concern in the public health sector, though, is not mirrored among the general public. Although most U.S. residents are generally aware of the virus, their specific knowledge regarding its symptoms and transmission routes is incomplete, their personal sense of threat of Zika infection is relatively muted, and their receptivity to various public health in-

tervention strategies varies by factors such as gender, age, and political ideology, among other characteristics. According to surveys of the U.S. population conducted by the NYU Program on Population Impact, Recovery, and Resilience, more than 80 percent of U.S. residents are aware of the Zika virus, but fewer than 40 percent know that the viral infection can be asymptomatic, could cause severe birth defects, and can be sexually-transmitted. Support for public health interventions varies greatly, as well.

Public health officials responsible for formulating risk messaging campaigns about Zika should be aware of these and other underlying factors that may influence the public's support of various public health interventions; simply educating the public to the potential risks and dangers of Zika infection may be insufficient to appropriately mobilize the public in the event of major outbreaks.

## Background

The Zika virus that emerged from South America in the past year poses a novel threat to humans. Similar to West Nile virus, malaria, or dengue, Zika is a vector-borne disease carried by mosquitos. Unlike those viral infections, Zika is unique in that it may also be sexually transmitted, although its level of infectiousness as a sexually transmitted disease is still uncertain. Furthermore, its most susceptible victims appear to be babies in utero, who are at risk for microcephaly and neurological and developmental disabilities.

Because of these multiple transmission pathways—and the scientific uncertainty about the virus's infectiousness—the hazards which place women and their babies at risk



Infant with microcephaly, 2016 Public Domain, Sumaia Villela/Agência Brasil

encompass a range of risk factors that can challenge public health officials in communicating about the threat of Zika. Public health strategies include environmental tactics focused on controlling mosquito populations; behavioral strategies, such as reproductive decision-making (delaying pregnancy, using contraceptives, or avoiding travel to areas with Zika infections); and clinical interventions, including screening and testing for infection and the availability of pregnancy termination services.

Compounding Zika's challenge is that it is mainly a silent infection. Four out of five people infected with Zika show no symptoms. Among those who do, the symptoms are often somewhat mild and short-lasting, and can include fairly non-descript symptoms such as a rash, fever, and headache. It is still unknown how infectious asymptomatic individuals are, and equally unknown how long the virus incubates in blood and semen. To date, the Zika virus has infiltrated 50 other countries in the Americas and the Caribbean and is making inroads to the continental United States. Given the absence of medical countermeasures such as vaccines or treatments, the basic public health strategy in the United States has been to focus on aggressive vector control campaigns in areas likely to be breeding grounds for mosquitoes that carry the virus and to be prepared to mobilize quickly in the event that outbreaks occur. Much of the strategy is predicated on targeted risk communication. As such, it is critical for public health officials to know their potential audiences, the public's knowledge and attitudes about Zika, and the pub-

lic's general receptivity to the most common public health strategies and messages.

## NYU's Zika Risk Perception Studies

The Program on Population Impact, Recovery, and Resilience (PiR2) at NYU's College of Global Public Health is conducting research on Zika funded by the National Science Foundation. The study relies upon a series of four nationally-representative population surveys conducted over the span of a year to examine how various social, scientific, and policy cues influence the U.S. public's perception of the risk of the Zika virus over time, as well as the public's receptivity to various clinical, environmental, and behavioral interventions. This report is based on surveys with 2,464 randomly selected U.S. residents over two waves of data collection. A telephone survey of 1,233 US residents was conducted in April and May of 2016 and repeated with 1,231 U.S. residents in July and August of 2016.

## Findings to Date

### *Awareness is not knowledge*

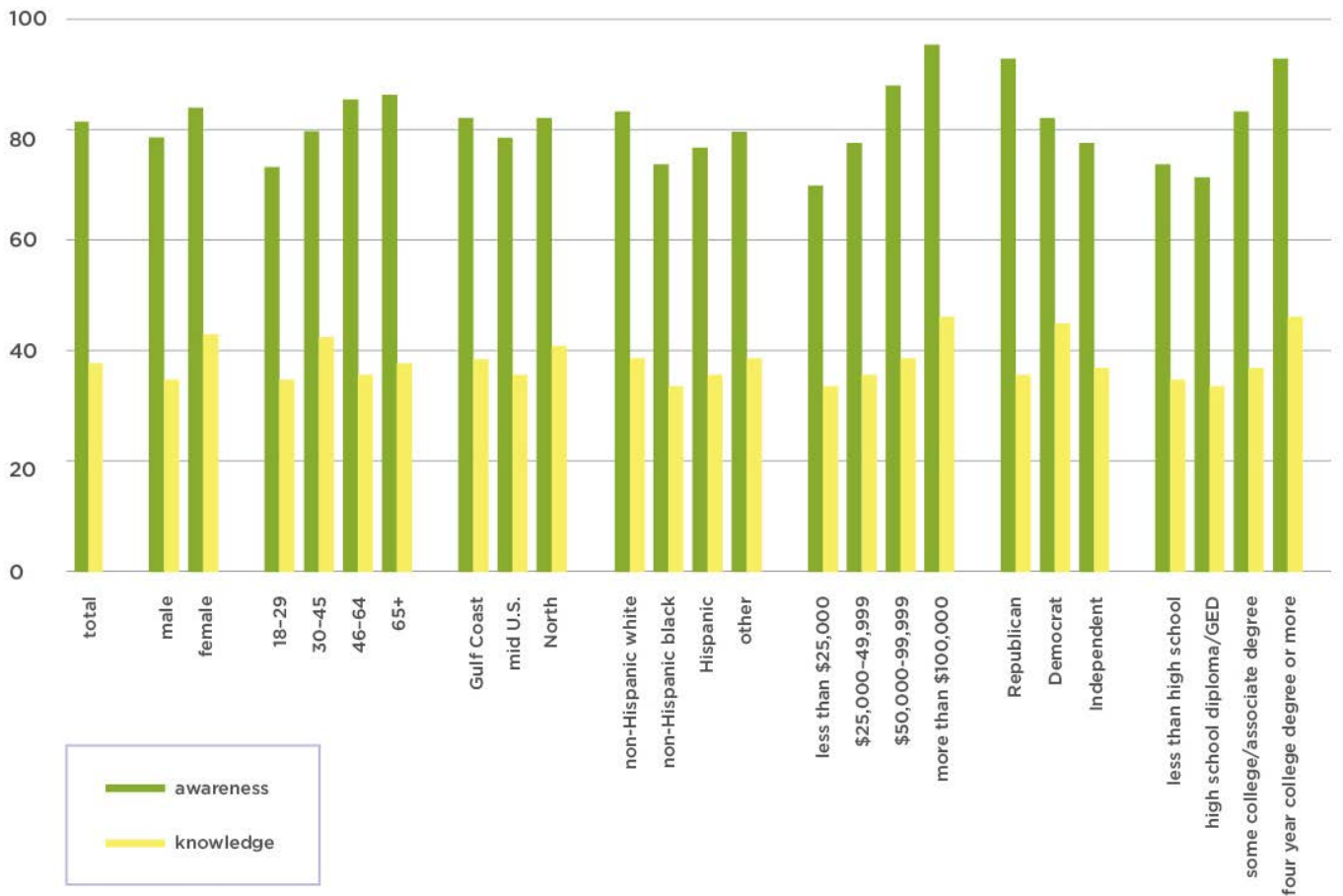
Awareness and knowledge of the Zika virus are distinct constructs. At its most basic, awareness reflects the broadest appreciation of the existence of the Zika virus. U.S. public awareness of Zika has changed in a short period of time. To estimate public knowledge about the Zika virus Abramson and Piltch Loeb constructed a measure that encompassed a respondent understanding that the Zika virus could (1) cause birth defects, (2) be expressed as an asymptomatic infection, and (3) be sexually transmitted.

As reported in Table 1, below, although the proportion of the U.S. population or the subset of women of child-bearing age who are aware of Zika has increased in the three-month span from April to July, more specific knowledge about the virus remains low and has not changed over time. The authors found there are socio-demographic differences in who is aware and knowledgeable of Zika. Among the overall public, those likely to be more aware were women, older adults, non-Hispanic white adults, those with higher incomes, republicans, and those with higher education. Women and adults with higher education are also more likely to be knowledgeable about the virus. There are fewer socio-demographic differences when the analysis is restricted to women of child-bearing age, between the ages of 18-45, and they are slightly different

**Table 1. Awareness and Knowledge of Zika, U.S. population and Women of Child-Bearing Age**

	APRIL–MAY 2016	JULY–AUGUST 2016
% of U.S. population <b>aware</b> of Zika	77.9	84.8
% of women of child-bearing age <b>aware</b> of Zika	75.7	84.6
% of U.S. population <b>knowledgeable</b> of Zika	38.7	38.2
% of women of child-bearing age <b>knowledgeable</b> of Zika	41.8	45.0





Demographic Differences in Awareness and Knowledge of Zika.

than the overall population.

Abramson and Piltch Loeb also considered whether different types of primary information were associated with greater awareness and knowledge. They categorized the types of information sources as: (1) conventional media, such as broadcast, print, or online news, (2) social media, friends, and family, (3) one’s personal doctor, or (4) government. Those who list their primary source of information about Zika as conventional media are 4.5 times as likely to be aware of Zika as are those who rely upon social media, friends, and family as their primary source of information. Those who list government as primary source of information (and this may be at any level, from federal to state to local) are more knowledgeable than those who report other sources of information.

*Intervention receptivity is varied and influenced by risk and knowledge*

Abramson and Piltch Loeb examined receptivity to three specific possible public health interventions: the behavioral intervention of delaying pregnancy, the environmental intervention of indoor spraying, and the clinical intervention of supporting access to federally financed abortion services for Zika-infected pregnant women. Among the overall U.S. population, 50 percent would delay pregnancy by a year or more, 39 percent would agree to indoor spraying; and, 62 percent supported the availability of federally-financed abortion services. As the authors did with Zika awareness and knowledge they conducted bivariate,

followed by multivariate analyses to paint a more nuanced picture.

First the authors analyzed the behavioral intervention of delaying pregnancy. Hispanics, those with less than a high school education, those in the highest income bracket, young adults, those living in northern states, those attending to government sources for information, and those who believe they are at greater personal risk for Zika are the most likely to delay pregnancy. On the other hand, non-Hispanic whites, those making less than \$50,000 annually, and republicans are least likely to support delaying pregnancy.

The public was least receptive overall to the environmental strategy of having public officials conduct indoor spraying. Those who identify as Hispanic were most likely to support intervention, as were residents with less than a high school education, young adults, and those who were confident in government. Republicans and older adults were the least likely demographic groups to support this intervention.

In a multivariate regression analysis, Hispanic race and confidence in government are among the most significant factors associated with increased intervention receptivity. Those who are confident in government are 1.8 times as likely to support indoor sprays as were those who were not confident in government.

Clinical strategies, represented here by whether an individual supports federally available abortion services for women impacted by the Zika virus, had the highest overall support, at over sixty percent. Democrats, those of “oth-

er” race, and those with knowledge of the Zika virus were most likely to support this intervention. Those who were not confident in government and republicans were least likely to do so.

In multivariate analyses, democrats, independents, and those who are most knowledgeable about Zika were most likely to support access to federally financed abortion services, all other factors being equal.

## Summary

Although there have been limited outbreaks of Zika infection in the continental United States, the threat of the Zika virus remains present. In the absence of medical countermeasures such as vaccines and anti-viral treatments, the most effective tools relate to prevention, mitigation, and surveillance. For all of these, public health risk communication is critically important to generate support for public health intervention campaigns, and for encouraging those population practices which can limit viral transmission. Among the key findings from this initial analysis of U.S. public attitudes, behavior, and knowledge are the following:

1. Understanding the public’s primary source of information for public health threats such as Zika is a critically important factor in promoting awareness and knowledge. Those members of the public who said that conventional channels such as broadcast, print, and online news media served as their primary source of information were nearly five times as likely to be aware of Zika than were those who relied upon family, friends, or social media. And those who relied upon government sources of information were nearly three times as likely to be knowledgeable about Zika as were those who relied upon informal sources and social media. Although this does not account for the “amplification” effect that can occur with media of many types—for example, in which a governmental pronouncement or a scientific finding is first amplified by conventional media and then further amplified by social media—it does suggest that the most basic means for educating the public about the general contours of a threat such as Zika may still rely upon the more traditional channels of conventional media and government campaigns.

2. Promoting different public health interventions may require different communication strategies, particularly during a period of evolving scientific certainty. In this analysis we examined a behavioral, an environmental, and a clinical intervention. No single factor was associated with increasing the public’s receptivity to all three of these interventions. The public was more receptive to a behavior change such as delaying pregnancy if they believed themselves at personal risk. However, that heightened personal risk was not associated with their willingness to accept a government program of indoor spraying. Instead, the public’s willingness to accept that type of environmental intervention was much more related to their overall confidence in government. Lastly, the public’s appetite for a clinical option such as federally-financed abortion services for Zika-infected pregnant women was associated with greater knowledge about Zika, regardless of their political ideologies. Risk communicators should consider highlighting

different aspects of their messages—whether increasing knowledge of transmission routes, conveying the actual risks posed by various vectors, or promoting the trustworthiness of government or public health organizations—depending upon the intervention they wish to advance.

3. As with any potential health threat it is useful to know the public’s appetite for various public health interventions, and the factors that would either spur or inhibit their acceptance of such actions, before the threat appears. The public health and scientific communities may be mobilized and vigilant about widespread Zika outbreaks, but for the moment, at least, the public is neither alarmed nor particularly activated about it.



## Authors

NEW YORK UNIVERSITY Associate Professor David Abramson is the founding director of NYU’s Program on Population Impact, Recovery and Resilience (PiR2) and a faculty member of NYU’s College of Global Public Health. Previously, Abramson was the Deputy Director at Columbia University’s National

Center for Disaster Preparedness at the Earth Institute.

Abramson has led a number of research studies examining the long-term impacts of disasters on communities and on vulnerable populations, including work after Hurricanes Katrina and Sandy and after the Deepwater Horizon Oil Spill. Abramson is presently leading an NSF-funded RAPID study of the Zika virus and risk perception, as well as an NIH-funded recovery study of Katrina survivors.

Among his research-to-action initiatives, Abramson and Lori Peek co-direct the SHOREline youth empowerment project, a curricular project-based learning program presently operating in a number of Gulf Coast and New York City high schools.

In addition to the disaster recovery work related to Katrina, Sandy, and the Deepwater Horizon oil spill, Abramson has studied short-term post-tornado community recovery in Joplin, Missouri, disaster recovery planning in four mid-sized U.S. cities, risk communication strategies, and organizational and attitudinal aspects of disaster preparedness.



RACHAEL PILTCH-LOEB is a junior research scientist at NYU’s College of Global Public Health’s Program on Population Impact, Recovery, and Resilience and a doctoral student. Piltch-Loeb has been a part of the program from its inception at NYU, working on projects related to health, well-being, and long-term recovery from disasters, especially Superstorm Sandy. She received her masters degree from the Bloomberg School of Public Health at Johns Hopkins University and her undergraduate degree from Georgetown University. Piltch-Loeb’s current research interests are in interdisciplinary public health systems improvement.





Kenny Bellau (left) in front of the boat he used to save hundreds of lives © Kenny Bellau, 2005

## A TALE OF TWO FLOODS

### Katrina, Baton Rouge, and the Lessons in Between

*An interview with Kenny Bellau, by Elke Weesjes*

WHEN BATON ROUGE and other areas of Louisiana flooded last summer, many of those active during Hurricane Katrina made their way to hard-hit Livingston Parish to offer help. Among them was Kenny Bellau, an eighth generation New Orleanian whose heroic efforts after Katrina helped save 400 lives. Curious about how the two efforts compared, I recently interviewed Bellau by phone. His accounts—some harrowing, some mundane—highlight the substantially different effects of flooding in urban and rural communities.

When Hurricane Katrina made landfall, Bellau, a semi-professional cyclist, was racing in French Guyana as a member of Herring Gas, a Louisiana-based cycling team. Worried about his cat and his family—especially his elderly mother—he hurried back to his beloved hometown. Bellau arrived two days after the levees broke and managed to talk his way into the closed-off city. He drove to his home, which was damaged but not flooded, and rescued his cat, Simon. His mother's house, in a different part of town, was flooded and his elderly mother and brothers

were nowhere to be found.

"I could not get in touch with either of my two brothers or my mom," Bellau said. "They were smart enough to know that they should evacuate, but Katrina was the fifth time the city was asked to evacuate in the space of three or four years. And all those other times, the hurricanes took a left turn and we got nothing but a couple of bent trees in the city. People were exhausted. Every time my mom left, she was stuck in that crazy traffic and it would take countless hours to go a short distance. And then there were the stories of people breaking down while trying to leave, people getting robbed, and houses getting looted. As a result, many people in New Orleans decided to stay put. I wasn't sure if anyone in my family was among them."

As it turned out, Bellau's mother had evacuated a day before Katrina hit land. She had decided to go to a farm in Mississippi where she'd spent her childhood. The drive from New Orleans to the farm usually takes two hours, but on that day, it took 14 hours, Bellau said. Since his mother did not have a signal in the rural area she was staying and





"This is the bow of my pirogue. I took it from the facilities manager at Loyola University." © Kenny Bellau, 2005.



Saving all lives © Kenny Bellau, 2005.



Superdome New Orleans © Kenny Bellau, 2005.



"Here lays Vera" © Kenny Bellau, 2005.

Bellau himself could only send text messages, it took some time before the two were able to connect.

While he was waiting to learn more, Bellau decided to look for other pets that were left behind by their owners. Swapping his car for a boat, Bellau roamed the flooded streets of New Orleans. He was assisted in his efforts by his now-wife Candy Johnson, who was living in Long Island, New York, at the time.

"Candy was looking on NOLA.com, on a blog where people were looking for their pets," Bellau remembered. "She posted a message that explained that I was getting Simon and that I might be able to get other pets too. All the crazy cat people saw that message and contacted Candy, who in turn would send me text messages with their addresses. 'Can you save my cat?' quickly became 'Can you save my dog?' and by the time I got on a boat it became 'Can you go and check on my grandmother?' Once it [became requests to look for] people, it took me a little bit by surprise and I thought: I am here by myself; these people have no one else to turn to and they are not asking for their dog, they are asking for their family member.' It still chokes me up a little when I think about it."

At first Bellau used a pirogue, a Cajun canoe, to ferry people and animals to safety. After a few days, he spotted a group of police boats.

"I saw this flotilla of police boats and they were all from other states," he said. "I repeatedly told the officers on the boats that I had this list of people who were stuck in their houses. They said, 'Just give us the list and we'll see if we can get to them.' But they didn't let me on their boats. They probably thought I was a crazy person, in fatigues and in a pirogue."

These officers were all from police forces outside of the city, explained Bellau. Once they got shot at by armed looters, they realized that they had no authority to do anything and were instructed by their superior to stand down.

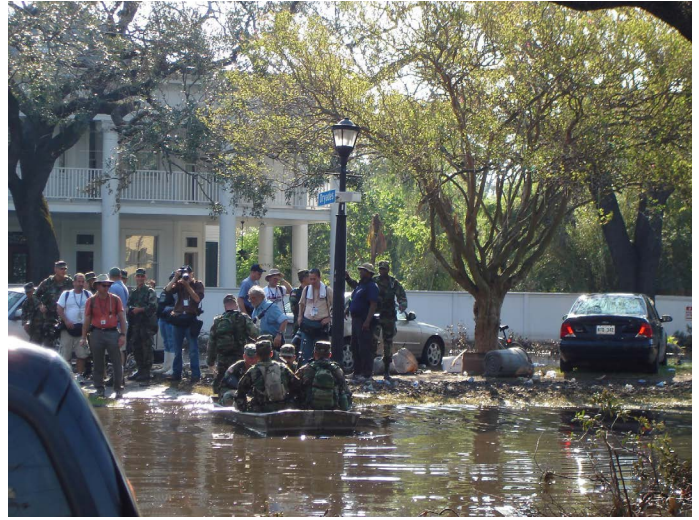
"At that point, it was citizens vs. citizens. They could shoot back, but it wouldn't be a police shootout with a looter," said Bellau. "It would be a citizen from another state in a shootout with a looter. So their commanding officers told them to park their boats. I took one of these boats after they had left."

One of the things that infuriated Bellau was the fact that other boat operators refused to rescue animals, which





On the flooded streets of New Orleans © Kenny Bellau, 2005.



"Everyday, we were swarmed by reporters. No one was doing rescue at this point but us. The NOPD had given up" © Kenny Bellau, 2005.



"We took people's boats every day. We had no choice." © Kenny Bellau, 2005.



"Katrina Takes Aim" © Kenny Bellau, 2005.

forced pet owners to choose between their personal safety and their pets. Bellau, however, made it his mission to save all lives, animals and humans. Fortunately, the military forces that arrived on the seventh day and teamed up with Bellau, shared his mission.

"The military put me in control over all the water rescues in uptown New Orleans," said Bellau. "Every morning they gave me a platoon of soldiers and I told them every day that rule number one was that we'd take all living things. Dogs, cats, birds, they all came on the boat. The military guys loved that rule."

The California National Guard turned to Bellau to lead rescue expeditions because he had already been so successful in rescuing people and animals. He also had a thorough knowledge of the city's geography and the ability to understand the notoriously difficult local lingo.

After 17 days, the water in New Orleans finally receded and the military ceased its search-and-rescue missions. Once the water had gone down, Bellau finally had a chance to inspect the damage on his mother's house—the house he grew up in.

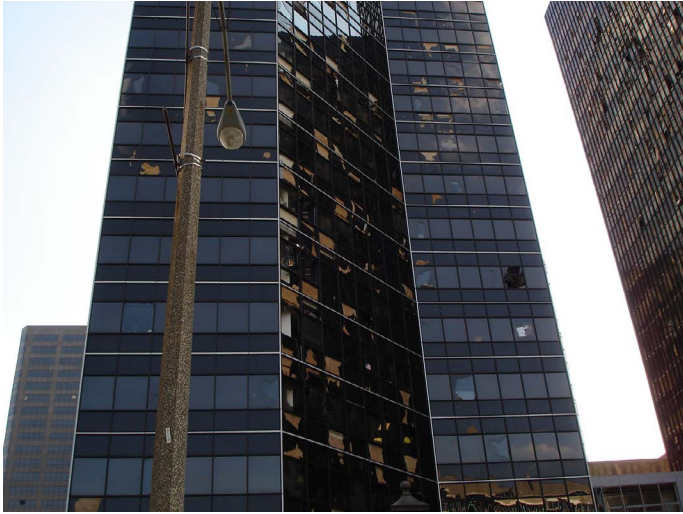
"My mom's roof got destroyed so it got a lot of water in

from the top and it flooded with five feet of water from the bottom. It was completely devastated," Bellau said. "It was covered in mold and mud. At first glance, we thought that we would have to tear it down. But we didn't tear it down, three years later, somebody bought it and renovated it."

After Katrina, life returned to some kind of normalcy. Bellau, however, struggled much more with his experiences than he'd expected. He found it difficult to admit that he was suffering from Post Traumatic Stress Disorder.

"I am a person who is all about being an athlete and being part of a team," he said. "And here I was after the storm. There was no team around me and I kind of isolated myself and didn't seek out any help. One of my reasons for that was that I was on a boat with these soldiers who had lost friends in Afghanistan and Iraq. I didn't want to feel sorry for myself for the things I saw during Katrina. It sounds silly but I didn't feel worthy to even give myself the PTSD label. But eventually, I was talking to some of the army guys and they said, 'you show all the signs, you have PTSD.' But I never looked for professional help. I should have though. PTSD is a lonely and awful thing. I was angry at the world, I shut myself in, and stopped communi-





New Orleans © Kenny Bellau, 2005



Day 9 of the storm. © Kenny Bellau, 2005



"Checking in" © Kenny Bellau, 2005



"Chopper rescue. Man, those things were loud. The rotor blast pushed the boat about a block down the street." © Kenny Bellau, 2005

cating with my friends and family."

After a long period of darkness and isolation, Bellau was able to turn things around. He got back on his bicycle and was able to process what had happened through physical activity.

"I started putting it out of my mind," he said. "And then the five-year anniversary came around and that is when they took my boat and put it in a museum. I began to realize that I was lucky to have experienced Katrina. There were so many guys who wanted to help but they were stopped at the border of the city. People with boats tied up to their trucks, with goods, but the state police or the army turned them around. I was in the middle of it. And I kept on running into people who said 'I wish I could have been there with you.' I realized that I had seen something that not many others had seen. I also felt that I had a responsibility to tell the story."

Bellau did indeed tell his story. He was featured in several national magazines and newspapers, including the *Washington Post*, *Newsweek*, and *People magazine*.

During the most recent flooding in 2016, Bellau wanted to use his unique experiences and expertise, so he jumped in his truck and drove to Baton Rouge. Considering the fact that he had struggled with PTSD for years this might come as a surprise, but, as Bellau explained, the responsibility he felt to help trumped everything. The situation in Baton Rouge, however, was very different, and in hindsight his help wasn't as needed as it was back in 2005.

"Most of the land that was flooded around Baton Rouge was rural. There were only between 40,000 to 60,000 homes that were affected," he said. "The damage to these houses was minor compared to the damage done by Katrina and the flooding that followed. The damage to the houses in Baton Rouge was the same or similar to Katrina, but without the wind damage. It was just a fraction of the number of houses in Katrina and there wasn't the human suffering aspect. And the water was gone in a day or two, compared to 17 days after Katrina."

But the biggest difference, according to Bellau, was the level of resilience and resourcefulness in these rural areas.





"My mother's house." © Kenny Bellau, 2005



"My mother's house was completely devastated." © Kenny Bellau, 2005



The boat © Kenny Bellau, 2005



Happier times, Candy Johnson and Kenny Bellau on their wedding day in front of the boat that is now part of an exhibit at New Orleans' Presbytere museum © Kenny Bellau,

"There were more people helping in Baton Rouge than people who needed help. I was at a loss for something to do. I was literally just in the way," said Bellau. People in the city don't really have the resources. They don't have cars, boats, shotguns, and hip-waders; while the rest of Louisiana does. You don't have to rescue an Eskimo when it snows!"

Still determined to do something, though, Bellau found a couple of local firemen who needed an extra pair of hands getting people out of their houses. He also ran into some women stranded in a car.

"Their car was stuck so I pulled them out with my truck," he recalled. "They were trying to get to a relative of theirs. I used Google maps to find the address and dropped them off at their relative's house, which was also kind of flooded but they felt they were good there. And that was about it. I kept on offering my help but the situation was under control. There were more boats leaving Baton Rouge than going in. In short, in Baton Rouge you had people with the resources who could help themselves. And there were a lot

of people in surrounding areas who had learned their lessons from Katrina and were already prepared to go in."

Further reflecting on the disasters, Bellau noted that, compared to New Orleans, people in rural Louisiana didn't like government intervention and had a do-it-yourself attitude. He also observed that while we often consider poor people and people of color as more vulnerable to disasters, this didn't seem to be the case in those rural areas.

"I ran into a lot of black folk up there and they too had a boat, a gun, hip boots, and everything," he said. "They didn't need my help."

This statement touches on what is perhaps the most important lesson we can learn from Bellau's experiences and observations during these two disasters. Aside from populations, it is also vital that we identify locations (i.e. rural vs. urban communities) as vulnerable. It is clear that sometimes the assumptions we have about what people need and experience in a disaster are wrong—even (or especially) for someone with worst-case scenario experience.

# Our Shop

## *Readers explain their Organizations and Projects*



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### **The Alliance for Integrative Approaches to Extreme Environmental Events**

*By Jennifer Henderson and Kelvin Droegemeier*

MOST PEOPLE who work in the hazards and disaster field realize the immense difficulty of predicting threats, communicating them, and understanding the responses to and recovery from such events. No single discipline can provide a solution; so numerous disciplines and multiple organizational perspectives have to be involved.

Yet building bridges between different experts, scholars, and practitioners poses significant challenges. Institutional and financial barriers arise when working across groups or organizations and terms and techniques for analyzing data aren't the same across different disciplines. For example, concepts change meaning when used across disciplines and jobs tend to focus attention on different parts of the problem. This observation is nothing new. We in the hazards and disaster community talk frequently about ways to create opportunities for interdisciplinary collaborations and to sustain successful efforts. This article highlights a new way to address these issues.

Representatives from across the social, behavioral, and economic sciences (SBES) and operational meteorology have come together to offer a vision for a national "Alliance for Integrative Approaches to Extreme Environmental Events," or Alliance. Initially funded by a three million dollar private gift, the Alliance is an informal public-private partnership comprised of researchers from SBES disciplines, operational meteorologists, emergency managers, and other strategic partners (see Figure 1). The goal of the Alliance is twofold: to help those in this community

overcome obstacles to meaningful collaboration and to facilitate interdisciplinary research that advances the community's agenda to prevent societal harm from weather and climate disasters.

Below is an overview of the motivation and vision for the Alliance and work done to date.

#### **Motivation**

In February 2016, 50 tornadoes struck towns in the southern and eastern United States, killing ten people and injuring hundreds. In August, thirty inches of rain fell in just a few days, submerging homes in Louisiana and causing billions in damages and 13 deaths. In October, many on the southeastern seaboard endured damage and disruption due to Hurricane Matthew. Stories like these are all too familiar. As research across SBES demonstrates, these "naturally occurring events" take place in complex social and political contexts and solutions are not easy to find. Despite standardized approaches to these challenges, they require novel modes of inquiry, systems of learning, and working relationships across a spectrum of groups. We need more meaningful integration both within SBES and between our counterparts in physical science and practice (Brown, Harris, and Russell 2010). The Alliance will facilitate this type of effort.

#### **Vision**

The Alliance can be best described as an informally organized activity directed by the community it serves. The Alliance does not have a constitution, by-laws, or require-



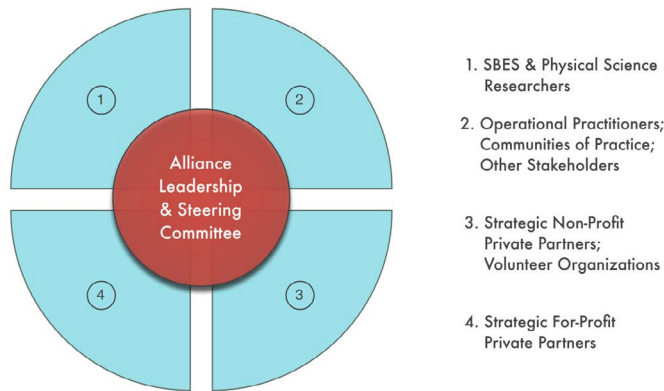


Figure 1. Administrative and governance framework of the Alliance

ments for affiliation. Indeed, membership in the Alliance is defined by simply participating. Anyone committed to alleviating suffering and preventing harm from extreme weather and climate disasters can be part of the Alliance. Yet, as described below, the Alliance will offer important tangible benefits and services to the community.

The Alliance is also a cooperative effort that links to existing groups—the Natural Hazards Center for example—to focus on issues not being addressed or for which additional support is needed. The Alliance is not an end in and of itself; it is a means to improving everyone’s work. In short, it is not a center, or a funding source, or a direct competitor to existing organizations. It is an entity focused on assessing the hazards and disaster community’s research and operational needs and understanding and addressing the forces that constrain our progress.

## Structure & Activities

A writing team made up of SBES scholars established the initial vision, mission, and structure of the Alliance using an approach that engaged the hazards and disaster community during the past several months. It is that same community that will decide its specific goals and outcomes in concert with a leadership team that will include paid professional staff to organize daily efforts. In addition, a volunteer-led steering committee, representing a range of research and practice in extreme weather work will be formed from the SBES and operational communities.

Based on this group’s expert opinions and with direct input from the wider community, the Alliance will identify specific problems that provide focus and shape exchanges and working groups. While we do not know at this time what issues will become top priority, we have considered ways the Alliance can build capacity. For example, the Alliance will develop mechanisms to help individuals identify and build relationships with specific collaborators both within and across disciplines. It will provide travel funding to facilitate and expand engagement among participants and build partnerships. It will analyze funding opportunities and translate them for multiple disciplines, facilitating pre-submission proposal reviews to maximize competitive advantage. It will identify resources for students and early career professionals and help them connect to each other and the research and practice community. And it will communicate community needs to funding

sources and help ensure full integration of all disciplines in solving relevant extreme event problems.

## Origination

The idea for The Alliance arose in 2015 at a workshop called Living with Extreme Weather (LWEW). However, foundations for the workshop and our ongoing efforts have been laid through years of workshops, meetings, and events in the broader weather and social science community, especially Weather and Society Integrated Studies (Demuth et al. 2007) and Weather Ready Nation (National Oceanic and Atmospheric Administration 2012). One of the most important outcomes of the LWEW meeting included a participant call for a framework that could actively and significantly integrate SBES disciplines, natural science research, and practitioner communities (Droegemeier et al. 2016). The Alliance is a manifestation of that framework.

*Please visit [www.alliance.ou.edu](http://www.alliance.ou.edu) to learn more about the Alliance.*

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*Temporary Shelter* jointly designed by IKEA Foundation, UNHCR and Better Shelter © Elke Weesjes 2016



*Woven Chronicle* by Indian artist Reena Saini Kallat © Elke Weesjes 2016

## Insecurities: Tracing Displacement and Shelter

Museum of Modern Art New York City  
October 1 2016 till January 22, 2017  
Organized by Sean Anderson, Associate Curator

By Elke Weesjes

INSECURITIES: Tracing Displacement and Shelter at New York City's Museum of Modern Art explores the ways in which contemporary architects, artists, photographers, and designers have addressed notions of shelter, borders, and safety in light of recent global refugee emergencies. It is part of *Citizens and Borders*, a series of projects at MoMA that offer a critical perspective on the histories of migration, territory, and displacement.

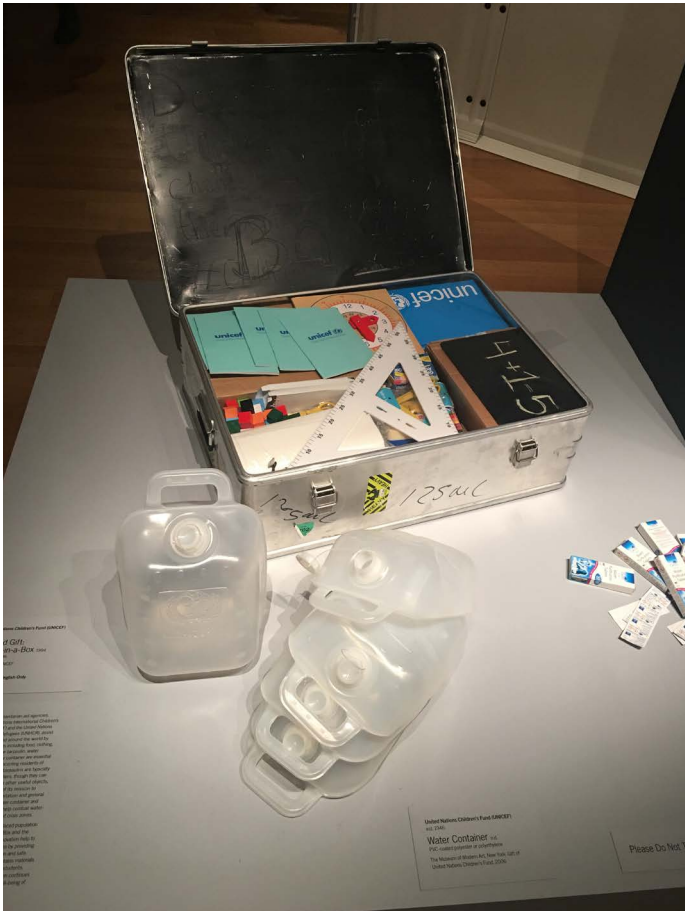
This powerful and timely multimedia display includes interactive maps, elaborate art installations, and photographs of refugee camps and types of shelter. Functional objects distributed by UNICEF—including as plastic tarpaulins, water containers, a School-in-a-Box (containing materials to set up a makeshift school for about 80 students), and Adolescent Kits for Expression and Innovation filled with art and craft supplies—are also featured.

One of the exhibit's art installations, *Woven Chronicle* by Indian artist Reena Saini Kallat, is especially worth men-

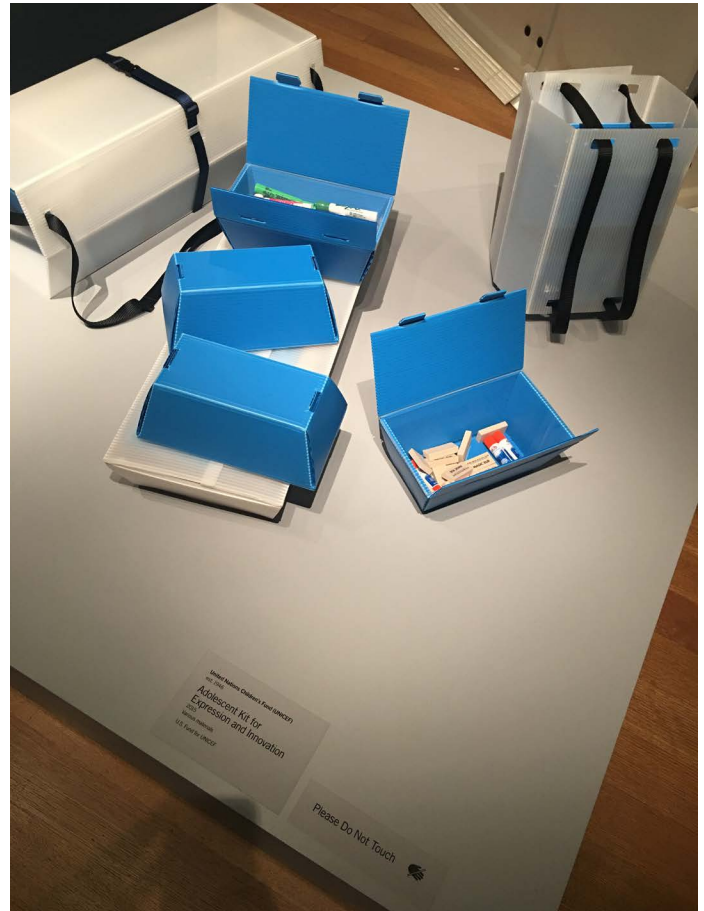
tioning. This very large and colorful artwork traces the history of forced displacement due to natural disasters, war, famine, and economic hardship. It resembles a map of the world meticulously woven out of electrical wire that's treated like yarn. The map is overlaid with additional strands of wire that identify numerous migration routes. Many of these strands morph into barbed wire to remind visitors that the world is often not an inviting, warm, or nurturing place for migrants and displaced individuals. The installation comes with a sound component—factory sirens, ship horns, electric pulses, and engaged phone tones that reflect the nomadic and vulnerable nature of a migrant's journey. The piece stands out not just in size—it takes up a full wall—but also because it stimulates all the senses and encourages the viewer to take a step back and absorb the story the artist conveys.

The exhibit's center piece is a modular emergency structure jointly designed by the Swedish IKEA Foundation, the United Nation's High Commissioner for Refugees, and the Better Shelter organization. The 190-square-foot steel-framed and polyolefin-paneled shelter takes about four hours to assemble without the need of additional tools than the ones included. It comes—in proper IKEA fashion—flat-packed with panels, pipes, connectors, and wires in cardboard boxes. A textile sheet with aluminum woven into the material lays over the roof reflecting the





The UNICEF School-in-a-Box contains materials to set up a makeshift school for about 80 students © Elke Weesjes 2016



The UNICEF Adolescent Kits for Expression and Innovation filled with art and craft supplies © Elke Weesjes 2016

sun during the day and keeping heat in at night. A solar panel on the roof provides enough energy to keep a light burning inside the shelter after dark and a door lock keeps people and their belongings safe.

Visitors can access the unit and for just a moment you can begin to imagine what it is like to live in temporary housing with your family. The units can stand in for the standard UNHCR tents that are half the size of the IKEA design, can't be locked, and have the life span of about six months. The IKEA shelters, on the other hand, were designed to last at least three years. Since 2015, the UN High Commissioner for Refugees has sent more than 16,000 units all over the world.

Besides shelters and migration, pieces in the exhibit focus on borders and how so called border thinking establishes the ways in which we, as societies and cultures, isolate ourselves and keep others out. An extract of UNITED's List of Deaths<sup>1</sup> emphasizes exactly how deadly that attitude can be. The installation takes up an entire wall just outside of the exhibit's gallery and offers a striking view of the death "wrought by Europe's inhumane migration policies" (UNITED, 2016).

1 UNITED for Intercultural Action is a European network against nationalism, racism, fascism and in support of migrants and refugees founded in 1992.

The full list includes the details—name, age, country of origin and cause of death—of more than 22,000 migrants and refugees who died attempting to enter Europe, or "Fortress Europe" as UNITED calls it. This piece, unlike most of the other objects and artworks, is remarkably political and in-your-face. The sheer number of names on the list, including many young children, is a stark reminder of the human tragedy that is the refugee crisis.

While art and photography can't solve the refugee crisis and well-designed shelters are little more than a Band-Aid to address this complex problem, Insecurities: Tracing Displacement and Shelter is nonetheless important. When it comes to the refugee crisis, widespread compassion fatigue has set in. As the continuing war in Syria has faded into the background, the world has seemingly moved on. This exhibit, however, forces visitors to once again focus on what is happening in Europe and the Middle East and more importantly, what we can do to help ease some of the problems.

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# Looking back

By Kathleen Tierney

I BECAME THE DIRECTOR of the Natural Hazards Center in August 2003. It was less than two years since the terrorist attacks of September 11, 2001, and Hurricane Katrina was still two years away. The late Mary Fran Myers, an icon in the field of hazards studies, was still serving as co-director of the Center and the Department of Homeland Security was less than one year old.

In 2003, our research community did not know exactly what to expect from the establishment of DHS, but many of us believed that creating a vast bureaucracy was not the best way to combat terrorist networks. The nation was still very much in the grip of fears about terrorism, and for a time it seemed as if the federal government had lost sight of the importance of hazards and disasters in its extensive efforts to combat terrorist threats.

Katrina changed all that, as the world watched the bungled response with horror and outrage. Katrina was a watershed event in the history of the Natural Hazards Center and in the field of disaster research. The Center funded an unprecedented number of Quick Response Grant studies that served as the basis for dissertations, journal articles, and books. Researchers began to look at disasters with new eyes as a consequence of Katrina, emphasizing the multiple ways in which race, class, gender, and other axes of inequality shape the chances and recovery experiences of those who are affected. The field also grew in size and diversity, as scholars who had previously had little interest in disasters became aware of them as a lens through which to view social structure and social dynamics.

I have so many positive things to say about our work during my time at the Center that they could easily fill this entire issue of the *Observer*. We did our part to spark dialogue between the climate change and disaster research communities and acted as honest brokers in important debates related to hazard insurance, homeland security, the Federal Flood Risk Management Standard, and other policy issues. We provided spaces where members of the research community could interact with government officials and practitioners. Over the years, our annual workshop grew in size and offered ancillary meeting opportunities for U.S. and international organizations such as the

Natural Hazards Mitigation Association and the International Research Committee on Disasters. Other groups increasingly asked us to organize meetings and other events around the time of the Workshop. We revamped our information products to make them more informative, attractive, and user-friendly, and we modernized our library to make materials accessible virtually everywhere in the world. We also like to think that we did our part to help the research community become more diverse with respect to race, ethnicity, and gender—for example through our partnership with the Bill Anderson Fund.

## **If our social safety net is weakened, more people will be vulnerable to future disasters**

There is much to celebrate, but there is also reason for serious concern going forward our new Center director and the entire hazards community have their work cut out for them. For the sake of this and future generations, it would be utter folly to reduce U.S. participation in the Paris Climate Agreement, tamper with funding for global climate change research, or interfere with efforts to reduce greenhouse gas emissions. As we saw with the 2008 financial crisis, deregulation—both in the financial sector and other arenas—can lead to risk buildup, moral hazard, and disaster. If our social safety net is weakened, more people will be vulnerable to future disasters. Going forward, social science research will likely be under attack as never before, but without such research, how can we have any hope of understanding the complex society and world in which we live? We are hearing a great deal about increased investments in our nation's infrastructure, and that is something to celebrate. We all look forward to needed advancements in transportation, communication, and other systems. But our nation also includes a civic infrastructure that must be preserved and renewed. That infrastructure is the foundation of resilience in all its forms. If we allow our social fabric to fray, we do so at our own peril. These are some of the many reasons why the work of the Hazards Center continues to be so important and why it merits continued support.

It has been an honor and a joy to direct the Center for the past thirteen years, and I deeply value the many friendships and collaborations I have developed over that time. Beginning on January 1, 2017, I will continue my research and writing activities as a research professor in the Institute of Behavioral Science. I look forward to playing a role in the activities of the Hazards Center and to assisting our new director as the Center continues to evolve.

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# Moving forward

By Lori Peek

*“What do you hope to be doing five years from now?”*

THAT IS THE QUESTION Gilbert White, the famed geographer and visionary founder of the Natural Hazards Center, asked me in the early spring of 2004. We were sitting together—me on the carpeted floor, he in a rocking recliner chair—as we waited for a chance to visit with Mary Fran Myers, who was then the co-director of the Hazards Center. Mary Fran was receiving in-home care for cancer, and we were reflecting on the ways that she had made it her life’s work to bring people and knowledge together to reduce hazards losses. Thus, when Gilbert posed that pivotal question, I was certain he wanted to know more than what title or affiliation I hoped to hold in the future. He was asking me what I wanted to do with my life.

At the time, I was a graduate student in sociology at CU-Boulder. I had also spent the past four and a half years working as a research assistant under the guidance of the inimitable Hazards Center director, Dennis Mileti. So I was familiar with the gentle ways that Gilbert would ask big questions of those around him, although I never felt fully prepared to answer him. Yet, that day gave me special pause. My heart was filled with sadness over Mary Fran’s illness, and my head was clouded with uncertainty as I struggled to finish my dissertation. As I sat with Gilbert, though, I felt a sense of calm clarity. I knew by then that I would pursue an academic career, and I told him that I was certain I would continue to collaborate with hazards and disaster researchers and practitioners working in vulnerable communities. When pressed by Gilbert to explain why, I remember saying simply, “Because they are the most caring and dedicated people I’ve ever known, and they are doing some of the most important work I can imagine.” Blue eyes twinkling, he just smiled and nodded.

More than a decade later, I still feel the same way about this precious and vital community. It is thus with great honor and a profound sense of responsibility that I prepare to assume the position of director of the Natural Hazards Center and professor of sociology at the University of Colorado-Boulder. In anticipation of this transition, I have spent much time thinking about the Center’s past as well as its future.

On the one hand, it seems to me that the core mission and aim of the Natural Hazards Center remains as critical as ever. Gilbert captured it perfectly back in 1976, in this short newsletter announcement: “The Center, through the *Observer* and its other activities, attempts to put potential users of research, such as federal, state, or local officials, or insurance and business executives who are concerned with disaster preparedness or assistance activities, in touch with those who are doing research on these subjects. Its aim is to help both groups to develop methods for applying the results of such research to policies and opera-

tions, and to determine questions that need further study.”

On the other hand, the world has grown and shifted dramatically in the four decades since the Center’s founding. There were just over 4 billion people living on the planet in 1975, the year that the Assessment of Research on Natural Hazards (commonly known as the “First Assessment”) was published by Gilbert F. White and sociologist J. Eugene Haas. Today the global population has exceeded 7.4 billion. The U.S. population has also expanded, jumping from 216 million in 1975, to 324 million in 2016. Population growth combined with climate change, unsustainable development and inadequate land-use planning, rising inequality, and a host of other social, political, and environmental challenges has translated into disproportionate loss of life among the world’s poorest people, and lopsided economic losses in the wealthiest communities and nations.

So in this moment of looming environmental threats that are without precedent, it seems ever more urgent that we come together as a hazards and disaster community and ask: What are we going to do to understand, articulate, confront, and reduce the risks that we face as a nation and a world? How are we going to mobilize to ensure effective top-down policy interventions that are informed by research evidence generated by scholars in this field, while also encouraging grassroots, bottom-up advocacy work in communities? How might the decades of accumulated knowledge from this field be applied toward creating a more just, equitable, and sustainable world?

These are some of the “forever questions” that Gilbert regularly introduced, and ones that Dennis Mileti institutionalized with the publication of *Disasters by Design* (widely referred to as the “Second Assessment”). I can assure you that our team here at the Hazards Center will steadfastly pursue work related to these questions. Moreover, as our community continues to expand—into new academic, private, voluntary, faith-based, and government sectors—we will engage in our traditional linking activities such as organizing the annual Hazards Workshop, maintaining the Center’s website and its large online and print collection through the Hazards Center Library, and publishing *Disaster Research* and the *Observer*. At the same time, we will begin a series of new mobilization strategies to ensure that the important knowledge and ideas produced by this community are moved into action. Most immediately, you will be hearing from our Center more often, as we send out requests for information and begin building a series of repositories for educators, practitioners, policy makers, journalists, and other stakeholders who we can work alongside to build a stronger culture of resilience in this nation and beyond.

I am so excited to begin working even more closely with the dedicated disaster scholars and practitioners I have long admired and the next generation of change makers I cannot wait to meet. I also hope that all of our *Observer* readers and users of the Center’s other products will join me in thanking the outgoing director, Kathleen Tierney, for her long and distinguished service and her scholarly leadership. We wish her all the best as she continues her important research and writing well into the future.

Here’s to 2017, to new beginnings, and to a safer, more peaceful world.



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**Build the Center Endowment**—Leave a charitable legacy for future generations.

**Help the Gilbert F. White Endowed Graduate Research Fellowship in Hazards Mitigation**—Ensure that mitigation remains a central concern of academic scholarship.

**Boost the Mary Fran Myers Scholarship Fund**—Enable representatives from all sectors of the hazards community to attend the Center's Annual Workshop.

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