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Introduction and Background

Thank you for the opportunity to prepare testimony on the role of emergency management research in coping with compound crises with a focus on extreme weather, social injustice, and the COVID Pandemic.

I currently serve as an assistant professor in the Emergency Management program at Massachusetts Maritime Academy. I have a doctorate in emergency management from North Dakota State University, the oldest emergency management doctoral degree granting program in the country. I have over a decade of emergency management experience beginning with recovery work in post-Katrina New Orleans. I have been to disasters across the country and seen first-hand the devastation they bring. I regularly conduct emergency management research related to disaster recovery, disaster volunteerism, the nonprofit sector, gender, and the relationship between emergency management and climate change. My work has focused not only on publishing research in academic outlets and making presentations to the scientific community, but also on advocating for the dissemination of emergency management research findings to practitioners and the general public through public engagement and science communication initiatives.

My testimony is organized into two sections. First, I will introduce the discipline of emergency management, its relationship to the broader study of disaster and emergency management practice. Second, I will highlight the urgency of funding for emergency management research, especially in the context of climate change and the COVID pandemic.

At this moment, people across the United States are struggling through disaster and its aftermath. Along the Gulf Coast, survivors of recent storms like Laura, Sally, and Beta have not yet returned home or rebuilt. People on the West Coast are trying to manage the public health effects of wildfire smoke. Iowa residents had to wait days for federal assistance after a derecho left Cedar Rapids and surrounding communities without power and with extensive damage. Three years after Hurricane Maria, Puerto Ricans are still waiting for all of the recovery assistance promised by the federal government. In states, territories, and tribal lands, all across the country people are fighting against the repercussions of systemic racism and social injustice, all while a pandemic that has killed over 200,000 Americans persists unabated.

These recent examples of trauma, destruction, and loss of life cannot be separated from each other. They are inextricably intertwined, and the emergency management system is on the frontlines of addressing them all.

People often mistakenly think emergency management is concerned only with efforts to save lives during the response to a disaster. In fact, emergency management encompasses much more, including the tasks done to mitigate risk, prepare our communities, and assist in disaster recovery. This is a broad and ambitious mission that requires the constant involvement of, as FEMA describes, the Whole Community — government, non-governmental organizations, the private sector, and individuals. While FEMA, at the national level, has the greatest emergency management responsibility, most of the actual work of emergency management is done by individuals, organizations, and agencies at all levels and in multiple sectors (Phillips, Neal, & Webb, 2017).

Another common misconception is that disasters affect us all equally and therefore require equal responses. In fact, disasters are inherently unjust. Research demonstrates that social vulnerability often intersects with physical vulnerability meaning the people who have the fewest resources often live in the most vulnerable places (Fothergill & Peek, 2004). With fewer resources these groups are less able to engage in pre-disaster mitigation and preparedness activities that would minimize their risk. So, when a hazard occurs these groups experience disproportionate impacts and have a particularly difficult time moving through the recovery process. While this occurs at the individual level it is also replicated at the community level. Gaining access to the resources needed to engage in effective emergency management may be more difficult for predominantly Black communities, and low-income communities. For example, FEMA funded home buy-outs have disproportionately benefited white communities (Benincasa, 2019) while programs like SBA loans disproportionately support the recovery of white communities compared to Black communities (Frank, 2020). Environmental racism is often found at the center of these disasters and so environmental justice must be centered in our response (see for example: Bullard & Wright, 2009).

As we see an increase in risk, impacts, costs, and needs related to disasters (NOAA National Centers for Environmental Information, 2020) there has arguably never been a more important moment for us to develop a more effective, efficient, and just approach to emergency management. In fact, as the consequences of climate change begin to manifest— especially changes to our risk of extreme weather events– emergency management's importance grows. Unfortunately, a persistent underinvestment in emergency management across the country has left this nation vulnerable (Krueger, Jennings, & Kendra, 2009). The longer inaction persists, the greater we can expect that vulnerability will become.

The State of Emergency Management Research

Scientists have long studied hazards and their impacts. Yet, it was not until the 1950s that a concerted effort was undertaken to understand human behavior during disasters. In the civil defense era, the federal government was concerned with how the American public would react to an attack on US soil. With federal funding from the Office of Civil Defense, a group of sociologists traveled across the country to systematically study the reactions of the public to all manner of hazards. Disaster sociologists dominated the field, doing this extensive fieldwork and writing foundational texts that laid the foundation for today's research (Rubin, 2012).

Over time, scholars across social and physical sciences have contributed to the study of disaster. Geographers provide empirical-based recommendations for land-use planning. Meteorologists

provide the information we need to be able to issue warnings. Engineers tell us how to design and construct infrastructure that can withstand various hazards. Sociologists help us understand the behavioral patterns in response. Psychologists explain how people interpret risk and address the mental health impacts in the aftermath of disaster (McEntire, 2004). While the scholarship from this diverse array of disciplines is fundamental to our understanding of disasters, these scholars do not synthesize their findings across disciplines, and rarely place them within an emergency management framework. This may inhibit the ability of practitioners to implement their important findings into practice.

In the 1990s (and further spurred by federal attention in the wake of 9/11) academic emergency management programs developed across the country (McEntire, 2004; Phillips, 2003) even as they too face challenges in accessing funding (Cwiak, 2014). Emergency management degree-holding has contributed to the professionalization of emergency management practice (Cwiak, 2018). Today, an estimated 46,000 students have graduated from these programs (Bennett, 2018). Their influence is reflected in practice as emergency managers have increasingly graduated from emergency management degree programs, and have some familiarity with the emergency management scholarship.

The granting of emergency management degrees, and the increase in scholars teaching emergency management, also invigorated a discussion about the emergence of an emergency management discipline. As the degree programs expanded to include several doctoral programs they produced scholars trained in emergency management research.

In the past decade, scholars determined that there was sufficient scholarship to suggest the emergence of an emergency management discipline (see further discussion in: Jensen, 2010; 2011; Klenow, 2008; McEntire, 2004). This spurred the FEMA Higher Education Program to sponsor a series of focus group meetings, which brought together the leading emergency management scholars and doctoral degree holders. Participants reached consensus on topics such as the disciplinary purview, basic research questions, and research standards. An important outcome of these focus groups was consensus on what emergency management scholars' study: "how humans and their institutions interact and cope with hazards and vulnerabilities, and resulting events and consequences" (Emergency Management Institute, 2015, p. 2).

One product of the FEMA Higher Education focus group was a summary of the primary research foci that fall within the purview of the emergency management discipline:

- *"Describe and explain variation in and patterns related to* how humans and their institutions perceive hazards, vulnerabilities, and resulting events;
- *Describe and explain variation in and patterns related to* the how humans and their institutions cope with hazards, vulnerabilities, and resulting events through tasks and activities related to preparedness, response, mitigation, and recovery;
- *Evaluation and measurement* of the degree to which humans and their institutions are prepared, have responded, have mitigated, have recovered;
- *Evaluation and measurement* of the degree to which the tasks and activities undertaken by humans and their institutions result are *effective and/or efficient*; and,

- *Evaluation and measurement* of the degree to which the tasks and activities undertaken by humans and their institutions are *adaptive* (e.g., lead to sustainability, resilience, and/or resistance)." (Emergency Management Institute, 2012, p. 4)

The group also reached consensus on the following research-related disciplinary responsibilities for emergency management:

- "Collect, analyze, integrate, synthesize literature related to hazards, vulnerabilities, and resulting events;
- Generate new knowledge through original research (i.e., basic and applied) and critical assessment of existing hazards and disaster literature; and,
- Promote the dissemination, application, and utilization of the results of original research." (Emergency Management Institute, 2012, p. 4)

The emergence of the discipline has created a home for those who wish to study emergency management, and acts as a touchstone for the profession and others who do the work of emergency management. Importantly, the discipline of emergency management is distinct from the larger, more overarching field of disaster research. Emergency management scholars have unique responsibilities that no other academic discipline currently addresses. Further, the study of disasters remains incomplete without the efforts of emergency management scholars (Emergency Management Institute, 2012, p.3).

While these initiatives and the growing body of research are important and necessary steps, we lack a sustained funding mechanism for emergency management research. To my knowledge, there has been no comprehensive report analyzing the amount of funding specifically for emergency management research. However, in looking across the sources of disaster research funding, and the approach required to receive that funding, the barriers for emergency management scholars who wish to access these programs are apparent.

Disaster research funding has traditionally emphasized the hard sciences, specifically engineering and earth sciences, rather than the social sciences. Of course, research in these areas provides critical information that informs emergency management, but without a focus on social science research, these funding programs result in significant scholarly gaps (for a robust discussion see: Rodríguez, Wachtendorf, & Russell, 2004). While in recent years there has been a greater focus on social science research (see for example: Campbell, 2020) a negligible amount supports emergency management research specifically. When emergency management scholars are recipients of federal research dollars, it is often in the capacity as fulfilling a social science requirement for multi-disciplinary projects that focus heavily on the hard sciences. Again, while this work is important, emergency management scholars also need to do original emergency management research to be able to effectively participate in these multi- and inter-disciplinary projects.

The current lack of funding for original emergency management research (basic and applied) prohibits the advancement of the discipline and hinders our ability to better inform emergency management practice. Not knowing the answers to these questions means we may be investing resources ineffective, or at least investing in unproved strategies, that may be based on faulty

assumptions. In this way, emergency management scholars working within an emergency management framework, to answer questions relevant to emergency practice, are largely unable to utilize existing federal funding for the most pressing research questions in our discipline. The lack of funding for basic emergency management research is holding the discipline back, preventing researchers from being able to provide empirically supported advice to practitioners, or to contribute more substantively to inter-disciplinary disaster research. Those working in the discipline of emergency management are doing crucial work that no one else is doing. A research program that has specifically earmarked funding for emergency management scholars to do original research that could quickly be transitioned into practice and inform policy could lead to changes that save lives and money in the future. At the very least more social science disaster research funding is needed (Rodríguez, Wachtendorf, & Russell, 2004).

This is especially important in this moment because of the increasing interest in disaster research. Historically, individual researchers from diverse disciplines develop an interest in disaster research after large-scale or culturally important disasters (Comfort, Cigler, Waugh, 2012; Stallings, 2007). If this trend is to continue, the impending nature of climate change, societal trends, and policy choices are likely to result in continuous large-scale disasters that capture the interest and attention of more scholars across disciplines. Simultaneously, the logistical responsibility of emergency management scholars to synthesize the diverse themes and theoretical concepts produced in other disciplines will grow. This expected trend further cements our important role in the multi-disciplinary endeavor of disaster research.

Further, as there is an appropriate increase in interest among scholars in studying the consequences of climate change, and climate adaptation specifically, it would be particularly prudent to ensure that current findings of emergency management scholarship are well disseminated among academics, policymakers, and practitioners so that research efforts can be efficient and effective (see for example: Mercer, 2010).

Every year the federal government spends billions of dollars on mitigation, preparedness, response, and recovery (Currie, 2019). There is every indication that this expense will increase exponentially into the future unless urgent action is taken. We can engage in efforts to prevent these growing financial costs and minimize human suffering: climate change policy could be aggressively pursued and more could be invested in hazard mitigation (research has found that for every $1 the federal government spends on mitigation $6 is saved in response and recovery efforts (Multi-Hazard Mitigation Council (2019)).

Research also tells us, though, that we are not doing all that we could to effectively prepare for the response to and recovery from disasters when they do happen (see literature review: Nojang & Jensen, 2020). Further, once a disaster does happen the response and recovery do not always take an effective and efficient approach. We need more and better research on how to approach each phase more effectively, efficiently, and justly to ensure that our policy and practice recommendations are robust and well-supported by research.

We can expect the costs of disasters to continue to rise not only due to climate change inaction, but also in the absence of a concerted effort to invest in emergency management research and its implementation in policy and practice.

The Urgency of Funding Emergency Management Research

For many decades, the federal government has encouraged the development of emergency management practice. Mitigation measures have been implemented. We do more to prepare for disasters now than ever before. Our responses are often more effective and there are a number of recovery programs available for some survivors. These efforts have saved countless lives and helped communities across the country. However, emergency management needs to continue to increase across the country and the response to those needs has not always been commensurate.

Recently, there has been growing concern about the capacity of the emergency management system to meet these needs. Specifically, questions have arisen about the ability of federal programs that exist for these purposes to meet those needs.

The pandemic serves as a dramatic example of the strain felt within the emergency management system. At the beginning of the pandemic, every emergency management agency in the country, at all levels of government, activated simultaneously, for the first time in US history. Our current approach to emergency management necessitates that help will come from surrounding areas during times of crisis. The fact that each community was in the midst of their own response demonstrated a vulnerability in this system. I would like to tell you all about the effects of this simultaneous activation, but I cannot because we have not yet been able to study it in part for lack of funding.

Currently, I am serving as a Co-Lead alongside Dr. Tanya Corbin for the *Emergency Management and Policy Analysis* COVID Working Group through the CONVERGE program at the Natural Hazards Center at the University of Colorado Boulder as part of the Social Science Extreme Events Research Network funded by the National Science Foundation. This initiative seeks to advance social science, engineering, and interdisciplinary research. It is a much needed and incredibly valuable program that has brought together disaster researchers from around the world. The research agenda our team developed for this project focuses specifically on the capacity of the US emergency management community to respond to the COVID Pandemic (see the research agenda in full here: https://converge.colorado.edu/resources/covid-19/working-groups/issues-impacts-recovery/emergency-management-and-policy-analysis-in-a-pandemic).

Despite the federal funding, a total of $1000, that our group received to support the compiling of the research agenda, we have yet to be able to identify federal funding whose parameters align with our research questions and theoretical framework. As a result, we have been working, unfunded, for months in an effort to study this incredibly important topic that requires the collection of perishable data, while hoping that at some point funding options become available. This is a familiar scenario to emergency management scholars and should not continue to be.

Studying the strain on our emergency management system is important not only for what it tells us about how we have managed the pandemic response, but also for what it can tell us about the near and distant future. While it may be tempting to suggest the pandemic is an outlier event, and therefore concern about the capacity of the system is exaggerated, we also have pre-pandemic evidence of this strain in the form of the 2017 hurricane season. In the wake of Hurricanes Harvey, Irma, Maria, and 2017 California wildfires, the GAO conducted a report investigating

the ability of FEMA to respond to disaster needs across the country. That report found that FEMA was understaffed by the time Hurricane Maria occurred and that many positions were staffed by employees not considered qualified by the agency (GAO, 2018).

Disasters do not happen in isolation from one another. We must address not only our nation's readiness to manage a Hurricane Harvey, Maria, or pandemic, but also our capacity to manage multiple threats at once. Can we, in the midst of a pandemic, respond to a constant barrage of hurricanes, wildfires across the west, a derecho in Iowa, the aftermath of spring tornadoes throughout the Southeast, dam failure in Michigan, a heat wave in the southwest, all while the public protests systemic racism and police brutality?

The research does not suggest that the number of disasters we now face is an outlier, but rather just the beginning of what to come as the consequences of the climate crisis begin to manifest (U.S. Global Change Research Program, 2017). Understanding the strain that emergency management is currently under can address the changes we need to make in anticipation of our increasing risk.

It is not only government that is responsible for the management of disasters. As FEMA has emphasized, emergency management requires a Whole Community approach. Unfortunately, non-governmental parts of the emergency management system are also showing signs of persistent strain. As the pandemic began our national disaster nonprofits, including groups like the American Red Cross and The Salvation Army, estimated they expected to have as much as 50% fewer volunteers then in a normal year (Montano, 2020). FEMA calls disaster volunteers the "backbone of our recovery system" so any hindrance to their involvement is of great concern. As is the case with FEMA, it is not only the pandemic that has led to concerns about the capacity of national disaster nonprofits. There is evidence dating back to 2016 that some of these organizations, at various points experienced what has been termed "volunteer fatigue" (Montano, 2017) meaning they did not have enough volunteers or funding to meet the disaster-related needs across the country.

Many people rely on these various forms of institutional support during disasters (Gould, 2014) and evidence would suggest that this support is even more necessary now. Across the country millions of people have filed for unemployment and there is an increasing demand across the country at food pantries (Arango, 2020), all while there is still no sign from Congress or the White House that another COVID relief bill will be passed. This uncertainty, and the depth and scope of need, makes it even more difficult for families to make evacuation decisions or rebuild their homes in the wake of disaster.

This all comes at a time when our risk across the country is increasing as we begin to experience the initial consequences of the climate crisis and decades of poor development decisions that have not accounted for hazard risk. To put it simply: at a time of great need the systems and organizations that might otherwise be available to help are themselves strained and overwhelmed. It is a perfect storm.

In this moment there is a desperate need to ensure that we urgently take an effective, efficient, and just approach to emergency management, which requires us to make decisions based on

empirical research. Yet, as I have discussed, this empirical research will require substantially more funding.

While the focus has reasonably been on how the pandemic affects our ability to respond to other acute disasters, it is important to remember that it also affects every other phase of emergency management. Nearly everything we do in emergency management requires people to be in close proximity to one another meaning every facet of emergency management has been affected by the pandemic. The way in which we prepare has had to change as exercises and trainings have moved online. Response efforts have changed as communities quickly rethought how to utilize virtual emergency operation centers and run shelters without starting an outbreak. Communities already undergoing disaster recovery have felt the impact as financial resources shifted and volunteer help slowed (Wagner, 2020). Across the country, as local and state governments have begun to cut their budgets, the futures of many hazard mitigation projects have been put in jeopardy (Sommer, 2020). The repercussions will continue to be felt long after the pandemic ends.

It should be of grave concern to us all, but to Congress specifically, that as we know our risk to extreme weather events and other forms of disasters is increasing, our ability to manage them is already struggling to keep up.

Conclusion

Disaster scholars and emergency management experts have long argued for changes to the federal approach to emergency management. Common recommendations include the need for comprehensive emergency management that accounts for individual and community vulnerability and takes a proactive rather than reactive approach (Tierney, 2007); adjust the proportion of preparedness funding to better support all hazards (Kaufman, 2020); and calls to restore FEMA to an independent, cabinet level agency (see for example: An Independent FEMA, 2009). While I have focused on the role of emergency management research funding, given the purview of this committee, I mention these other reforms here because to implement them successfully requires that they are driven by robust empirical research.

In 2007 disaster scholar Dr. Kathleen Tierney testified before Congress that:

> "At this time, the goal of evidence-based emergency management remains elusive, but the need for objective assessments of programs and practices is clearer than ever before. Reasonable people might well wonder which emergency management practices actually achieve their intended results, where emergency management programs are falling short, and which investments are likely to bring the greatest return." (Tierney, 2007, p. 12)

Nearly a decade later we are largely left still wondering.

I will conclude by reminding this committee that disasters are not "Acts of God", nor are they natural. Decades of disaster research has exposed how it is the decisions that we make about where and how we live that create disasters (Kelman, 2020). The research shows us that disasters often stem from policy decisions, which indicates that different policy decisions will help minimize suffering and prevent disasters. In making those different policy decisions, we should

be guided by empirical research and support the advancement of that research through federal funding.

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