

**Emergency Preparedness: Are we ready for a 21<sup>st</sup>-century Hurricane Hugo?**  
House Committee on Homeland Security Subcommittee on Oversight and Management  
Efficiency  
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Mr. Chairman, committee members, panel members, and residents,

The topic of this hearing is the type of question that should be asked in communities across our nation – not just in South Carolina or along the Atlantic coast, so I applaud the subcommittee’s initiative and insight in convening this panel.

In determining and establishing preparedness, there is no “silver bullet” -- no one-size-fits-all answer. Working toward disaster resilience involves policy, politics, science, and human behavior, with a focus on creating a culture of preparedness across communities, sectors, and levels of government. The question posed by the subject of this hearing is a complex one. Are we more prepared than in 1989? In some ways, yes. But is there increased vulnerability to coastal hazards like tropical cyclones (tropical storms and hurricanes) as well as other hazards? Yes. Hence the importance of this discussion...

In emergency management and homeland security, professionals assess risk as a combination of likelihood of occurrence or threat, vulnerability, and consequence. Vulnerability refers to the susceptibility to incur harm or loss, including humans’ physical frailty or the exposure of property and infrastructure to damage. Proximity to the hazard is a key aspect of vulnerability, but there are other factors to consider. We often use computer models that help us quantify and visualize one or more of the three components of risk. Several years ago, colleagues at the Hazards and Vulnerability Research Institute at the University of South Carolina used a loss estimation model (HAZUS-MH, available from the Federal Emergency Management Agency (FEMA)) to estimate what a Hugo-type storm would do in South Carolina today. Selecting two counties as samples from those loss estimation results, Georgetown County could see 17 percent of county buildings damaged, 83 percent of schools unusable, and total economic impact (direct and indirect) of almost \$85 million. Charleston County would be estimated to see more than 69 percent of county buildings damaged, more than a third of residential structures with more than 50 percent damage, and zero percent of schools left functional, with a projected total (direct and indirect) economic loss of \$6.7 billion. (Hazards and Vulnerability Research Institute 2014)

We seek to learn from each disaster. As college students at Savannah State University and other institutions study emergency management and homeland security, they identify lessons from past events like hurricanes Andrew, Hugo, Floyd, Katrina and Sandy. They examine earthquakes and tsunamis, hazmat releases, and the attacks at the Murrah Federal Building and on 9/11. Our governments as well as emergency management agencies make adjustments, sometimes with beneficial consequences as well as unintended consequences that may not be completely positive. Response in Hurricane Hugo exposed challenges in communication and coordination across agencies (not uncommon for significant emergencies and disasters). Since then, particularly in the first decade of the 21<sup>st</sup> century, largely in reaction to the Sept. 11, 2001, terror attacks, the U.S. has developed a common Incident Command System (ICS) and invested millions of dollars in interoperable communications systems. These policy and investment activities can be expected to support improved coordination and communication in response to a major hurricane today. The extent of the benefits of these improvements will depend to a large degree on how they are embraced and implemented at the local, grassroots level.

After disasters, institutions and organizations try to identify and address weaknesses, or areas for improvement. But researchers also know that as time progresses from disaster events, the less we think about them and perhaps the less need we perceive to prepare for them or mitigate their effects. People tend to forget easily, and they often have the mindset that “it won’t happen, and if it does, it won’t happen to me.” The challenge is that disasters do and will continue to occur. It is up to residents and their leadership and government how prepared communities are to deal with them. Key to creating and maintaining a culture of preparedness is a realistic and current understanding of risk.

### **More at risk?**

As we consider the status of preparedness compared to 1989, consider the population growth of the southeastern U.S. in the intervening years. This plays a role in vulnerability as well as potential consequences. For example, South Carolina’s population increased 38 percent from 1989 to 2013, from 3.46 million people in 1989 to almost 4.8 million in 2013, according to U.S. Census estimates. Other states in the southeast experienced comparable and in several cases higher population growth.

In many ways, society moves to increase disaster vulnerability and consequences rather than decrease them. Consider the preference for living along the coast. In 1990, the population in the coastal floodplain in South Carolina, an area of about 2900 miles, was about 275,000 people; in 2010, the population living in the coastal floodplain was more than 400,000, a 47 percent increase in population (NOAA 2011). The percentage of this population younger than 5 years of age or older than 65 increased from less than 19 percent in 1990 to 23.6 percent in 2010 (see discussion below of social vulnerability

factors). This population growth impacts vulnerability in a number of ways, from increasing the number of people potentially in harm's way in a hurricane to increasing the number of people who will need to be on the road, or using some form of transportation, and who may need to stay in temporary shelters inland in an evacuation scenario. The increase in the percentage of young and elderly may increase the numbers of people who need additional assistance or are dependent on others in evacuation and shelter operations.

The committee also should consider the potential increases in both likelihood and vulnerability of other hazards because of other developments in the region, such as expansion of nuclear plant operations in Georgia and South Carolina and projected sea level rise associated with climate change. Sea level rise is expected to cause negative impacts not only for human safety but also for property value and stability and the integrity of critical infrastructure like transportation (roads, bridges, mass transit systems), water and wastewater treatment facilities, and energy transmission and distribution. While not a significant issue for this immediate area, urbanization also adds to the need to focus on risk awareness, mitigation, and preparedness, with the concentration of people and infrastructure concentrating vulnerability to natural as well as human-caused hazards. Damage caused to the New York subway system as a result of 2012's Superstorm Sandy is an easy-to-visualize example. Vulnerability comes in varied forms. In his book, *The Next Catastrophe*, Charles Perrow laid out a concise explanation of the vulnerability of the U.S. electricity grid, damage to or disruption of which could have significant impacts on critical infrastructure, the economy, and social stability. (Perrow 2007) In addition to hurricanes and tropical storms, South Carolina and nearby states face a range of other hazards, from cyber attack to hazardous material or nuclear release, to earthquake, flooding, tornadoes, and infectious disease outbreaks.

These examples illustrate that we need to examine risk frankly and on an ongoing basis. While guidance on this front is helpful from the federal level, risk assessment, mitigation, and disaster preparedness are fundamentally local, and to a degree regional and state activities. To improve disaster outcomes, the U.S. must build risk awareness, resilience, and preparedness capabilities at the local, regional, and state levels.

### **Social Vulnerability**

Research at my institution as well as others, including leading work by Susan Cutter, Ph.D., at the University of South Carolina, has focused on social vulnerability factors in disasters. This research recognizes the fact that as important as what a hazard – hurricane, earthquake, flooding, or explosion – does are the characteristics and resilience of the population, the people, where the hazard occurs. Social vulnerability factors include demographics like income; age; disability; educational level, literacy, and language; and

race and ethnicity that can tend to make individuals, households, and communities more vulnerable to the impacts of disasters. (Cutter, Boruff, and Shirley 2003) In South Carolina's coastal floodplain, almost 13 percent of the population is below the poverty level based on 2010 U.S. Census figures. (NOAA 2011) Research by SSU<sup>1</sup>, in Chatham County, Georgia, that focused specifically on residents representing socially vulnerable populations (data was collected in areas with high percentages of low income, minority, and elderly population), showed that while more than 70 percent of respondents thought it was important to evacuate when officials called for an evacuation, only 25 percent said they were very prepared or prepared to do so. (Rukmana, Bentley, and Clay 2011). Of those who said they would not evacuate if asked to, the biggest reason reported among survey respondents was lack of transportation to leave (26.4 percent). Almost 18 percent of those who said they would not evacuate said the storm and aftermath probably would not be as bad as officials predict. This research, and research in other locations with similar findings, illustrate the need to focus not only on the hazards but also the populations in areas with significant storm risk. For example, do local officials along the coast have a good understanding of the percentages and prime locations of residents without access to transportation?

## **Preparedness**

Preparedness includes planning, training, and exercise all based on a comprehensive understanding of the risk associated with identified hazards in a particular location. Preparedness also includes communicating clearly with the public about potential hazards, including risk associated with each hazard and measures they can take to protect and prepare their family, households, businesses, and communities. Preparedness is not about fear but about empowerment. It can, however, be a challenge to get and hold residents' and decision makers' attention on a "blue sky" day. When an emergency or disaster occurs, people tend to pay more attention to warnings and advice about protective measures. However, Dennis Mileti's review of research shows that people respond much better to protective action messages if they are familiar with the decisions and actions they may have to take and have time to consider the information, process it with family and friends -- "milling," and decide their course of action. Compliance with protective actions benefits from giving people clear, concise, actionable information on an ongoing basis so they will know what to do when an emergency or disaster occurs. (Mileti 2012) I raise this issue because this disaster public education activities requires ongoing work and focus by local and state government agencies charged with emergency management and homeland security with the assistance of private sector and non-governmental organization partners. It requires investment in local preparedness capabilities and activities that must be

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supported by every level of government. While some media may be free or low-cost, preparedness work with the public requires personnel time, a thoughtful approach, and communication through multiple, diverse means to reach all constituencies. The committee should evaluate whether enough emphasis is placed on empowering residents with information and resources so that the individual responsibility component of FEMA's "whole community" approach is a realistic goal.

Recent years have seen significant focus on emergency operations/response planning in many counties and cities in the U.S., particularly in vulnerable areas along the southeastern coast. County governments where there is significant risk and/or significant population are expected to, and generally do, maintain an emergency operations plan (EOP) or comprehensive emergency management plan (CEMP) and local hazard mitigation plans as well as other plans and procedures. In most cases along the coast, response plans and procedures include an evacuation annex or appendix to guide decision making and conduct of an emergency evacuation of large segments of the population away from the coast. As was evident as Hurricane Katrina came ashore near New Orleans in 2005, it is vital that local governments have personnel and systems prepared to implement evacuation plans. In Louisiana, research supporting an exercise in the summer of 2004 estimated that approximately 100,000 residents of greater New Orleans would not be able to evacuate or would choose not to evacuate in the face of a hurricane. The state and city had not, however, by August 2005 implemented actions to reduce this number by engineering large-scale transportation options and public education/messaging to support it. The estimate proved tragically accurate and resulted in tens of thousands of people in desperate circumstances and in increased hazards to human health and safety. South Carolina and its neighboring states must learn from this, even though their elevation, risks, and populations are different. As the state and this committee consider preparedness, take into consideration whether government at each level has committed the resources needed to build capabilities to carry out plans and protective measures. This includes involving the community in the planning process so that plans, procedures, and capabilities fit the end user. Engaging the community on an ongoing basis is key to the "whole community" approach to preparedness and empowers residents and households with the information, understanding, and tools to take individual responsibility.

In the southeast and Atlantic coast of the U.S., several states, including Florida, District of Columbia, Georgia, Louisiana, Mississippi, New Jersey, North Carolina, Pennsylvania, South Carolina, Tennessee, and Virginia have sought and achieved national accreditation through the Emergency Management Accreditation Program (EMAP). EMAP is designed to show that the jurisdiction has in place the elements of a viable emergency management program. (EMAP 2013) The development and application of voluntary national standards suggests an increased focus on building a consistent level of state and local capabilities for

emergency management, including preparedness (sections of the standards address risk assessment, planning, training, exercise, and communication with the public, for example). This is a positive step. However, few local jurisdictions (city and county governments) have sought and attained EMAP accreditation. Most of the local governments that have achieved EMAP accreditation are in Florida (see [www.emaponline.org](http://www.emaponline.org) for details; accessed November 16, 2014). This point as well as other indicators suggest the need for emphasis on local preparedness capabilities, both in South Carolina and in communities throughout the U.S. I cannot address whether each coastal county in the southeastern Atlantic has implemented mitigation measures to reduce damage or is prepared for a Category 4 hurricane or, in particular, whether their residents are ready and able to get out of harm's way. Other panelists may be able to address these questions for the jurisdictions within their responsibility. The point is that we need to make sure these questions are asked and addressed in each locale so that opportunities to improve preparedness can be addressed before the next storm -- or whatever hazard -- occurs.

In addition to the need for mitigation, response, and continuity plans and other preparedness activities, national standards as well as recent-vintage federal guidance call for communities to create and maintain pre-disaster recovery plans to identify the structure, stakeholders, and key priorities it will use as it works to recover from a significant emergency or disaster. These plans should be in place before a disaster occurs. Beaufort County, South Carolina, has maintained such a plan for several years, for example, and Chatham County, Georgia, is currently updating its recovery plan to align with heightened expectations for recovery planning. States with hurricane risk should work with local governments to facilitate pre-disaster recovery planning that includes representatives of diverse community interests and stakeholder groups.

As emergency managers are fond of saying, like politics, all disasters are local. Local policies and people will deal with the emergency or disaster before and long after other levels of government and organizations. This concept should be central to development of policy and budgets that support preparedness for hurricanes and hazmat releases, mitigation measures like land use restrictions and building codes, and protection activities for critical infrastructure.

As this subcommittee and Congress continues its work, key measures to improve preparedness for large-scale and catastrophic disasters for your consideration include:

- Leadership and support, working with local and state emergency management and homeland security staff, in building a culture of preparedness among residents and business in your districts and within your areas of influence.
- Support for research to better understand and assess risk from all hazards and to integrate that research in local planning and policy development.

- Continued and increased support for Emergency Management Performance Grant (EMPG) funding, which provides a modest base of funding for local and state preparedness activities in South Carolina and throughout the nation.
- Support of federal, state, and local initiatives focused on engaging the diversity of our communities in risk awareness and disaster preparedness.

Are we more prepared today than in 1989? Perhaps. Are we more vulnerable? Yes. I encourage the committee to continue to evaluate whether the investment of time, attention, and resources at every level is adequate to protect your communities and constituents.

Thank you again for your time and attention to these important issues.

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Attachment A

Coastal Population Change, 1970-2000

