Emergency/Disaster Management Case Study

PROBLEM DEFINITION, WHEN POLICY WORKS AND POSSIBLE ROLES

Brief overview of policy problem (opportunity). Every year, natural and unnatural disasters not only put people living in the whole of the United States, including its territories, at great personal risk of life and injury, but also put at risk the well-being of their property and the communities in which they live. Such risks are increasing precipitously given that the average yearly number of disaster declarations has increased substantially in the last 50 years. These include tornadoes, hurricanes, severe snow and ice, severe storms, earthquakes, wildfires, mudslides, floods, tsunamis, typhoons, and one volcanic eruption. In the ten year period from 2007 to 2016, the U.S. Federal Emergency Management Agency (FEMA) lists 614 major disaster declarations across the 50 states.[1] That is, from 1960 to 1979, the average annual number of disaster declarations equals 32 and from 1980 to 1999, this average grows to 51. In the first two decades of the 21st century, the average explodes to 124. Congressional staff note climate change as well as policy and administrative changes, population growth, and development patterns as just a few reasons for these increasing declarations (Lindsay and McCarthy 2015).

Disasters can have significant and depleting immediate and long-lasting impacts on government budgets and finances, as well, and these impacts may be difficult, if not impossible, from which to recover. The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI, 2019) estimates that the nation has experienced 254 weather and climate disasters from 1980 to the present for which total costs exceed $1.7 trillion. In 2019 alone (as of October 8), "there have been ten weather and climate disaster events with losses exceeding $1 billion *each* across the United States" (NCEI, 2019).

Further complicating relief efforts, governments may need to battle multiple, successive strikes of one type of disaster and/or the simultaneous occurrence of different types of disasters. For example, many western states and localities must manage wildfires year-round; the mid-west often experiences a string of tornadoes, one after the other, during storm season; and the east coast is usually hit annually with hurricanes, of various intensities. Layer on top of these natural disasters, the plausibility of unnatural ones occurring at the same time and in the same place, such as a mass shooting, plant explosion, train derailment, contamination of the water system and/or even government ransomware hack and the policy problem becomes extraordinarily clear. It is imperative that governments work together to prepare and respond efficiently and effectively amid inevitable disruption and destruction that disaster brings. This is in spite of the fact that in every case, the context of the community, the extant disaster, and the process of recovery are unique. That is, no two communities are exactly alike in capacity to withstand disaster, adapt to new circumstances following disaster, and ultimately, to restore, rebuild and mitigate in the aftermath of disaster.

When policy implementation works. Prevention, preparedness, response, and recovery—these are the overarching objectives of an effective emergency management system. Such a system helps prevent and deter natural and unnatural disasters in effective, fiscally sustainable, and equitable ways. This system assists people and communities to prepare for events that otherwise

[1] From FEMA, https://www.fema.gov/disasters/year. Does not account for three other FEMA designations—emergency declaration, fire management assistance declaration, and fire suppression authorization.

cannot be prevented in effective, affordable, fair, compassionate, and increasingly cost-effective ways. Such systems can respond to and help communities hit by disasters and the people who previously lived in them to recover as quickly and completely as possible in fast, fair, compassionate, cost-effective, accountable, and honest ways.

Possible roles of federal/state/local/regional levels of government. Federal, state, local, and regional governments all play critical roles helping people and their communities prevent disaster-related risks, prepare for disasters that cannot be prevented, respond when they occur, and recover after they happen. Governments do this by working separately and together, and often with a variety of other partners. Governments are most successful when they work together seamlessly, as each can bring to emergency management efforts distinct, but potentially complementary, perspectives. Local governments are on the ground level, closest to the people and communities affected. They can respond more quickly in the aftermath of a disaster, but also can put in place prevention mechanisms prior to disaster, such as building codes and emergency preparedness drills that reduce the costs of recovery after disaster. While local governments have the highest stake in a quick response and strong recovery for affected communities, especially if they are low income or small communities, they may have the least capacity for effective response and recovery. States and regional organizations can coordinate recovery efforts that span local borders while the federal government can coordinate efforts that span state borders. States can broker, coordinate and/or consolidate communication, management and fiscal flows to advance more efficient and effective recovery at lower levels. States and regional organizations can provide training, supplies, and services to bolster local efforts to mitigate damages resulting from disaster. Together with the federal government, states provide consequential research and evaluation that can inform recovery efforts at the ground level. The federal government can provide funding that if ably and smoothly channeled to the ground level in a timely way, can bolster a community's ability to return to "business as usual". The federal government spreads the risk associated with disaster by sharing data and scaling responsibilities and management (such as for purchasing) that can strengthen both state and local efforts to recover from disaster. Below we consider what has worked and what has not regarding emergency management in light of disaster and given how roles have operated in the past. Then, we articulate what has been learned from past experiences to inform the necessary transformation of roles and restructuring of responsibilities to support emergency management systems that can realize the objectives of effective and efficient prevention, preparedness, response and recovery to the broadest array of natural disasters possible.

DISASTER EXPERIENCES AND LESSONS LEARNED

What has worked and what has not. To discern definitely what works and what does not in the event of disaster is virtually impossible. As noted earlier, every community is unique as is every disaster; recoveries are distinctive in that no two are alike. What works well in one instance, may not work at all in another. Still, it is exposure to others' experiences, learning from these experiences, contemplation of multiple possible disaster scenarios and practice of response strategies that can help those on the ground level be able to respond more quickly, critically and effectively if (when) disaster strikes.

Hurricane Katrina

Consider the case of Hurricane Katrina, a catastrophe of historic proportions that required a first ever evacuation of New Orleans, Louisiana and ended in the displacement of 1.3 million people across the United States (Godfrey 2009). To date, there are hundreds of thousands of books, journal articles, government reports and congressional testimony that study the aftermath of Hurricane Katrina to tease out lessons learned as well as provide accountability related to mitigation efforts on the part of governments, nonprofits, private businesses and individuals. The evidence indicates a wide swath of woefully poor responses as well as innovative solutions to mitigation of this disaster (Roberts, 2013).

For example, congressional testimony records "significant control weaknesses" of federal government agencies and programs in the aftermath of the hurricane that contributed to fraud, waste and abuse of public funds—essentially depleting resources that had been allocated to victims of the disaster (Godfrey 2009). In articulating lessons learned and unresolved issues, N. Eric Weiss, of the Government and Finance Division, Congressional Research Service, highlights the web of issues that constrained effective recovery efforts (Godfrey 2009, 171):

> To many of those affected, the recovery has seemed slow and uneven. Rebuilding has been hindered by the severity of the damage, the need to limit future flood damage, and the need to coordinate the recovery among many levels of government. The dispersal of population has made public hearings and elections difficult. Pre-existing economic trends were already providing incentives for jobs and people to leave the area, not to stay.

Donald E. Powell, then Federal Coordinator for Gulf Coast Rebuilding, in testimony to members of the U.S. Senate Homeland Security Committee, explains challenges to an "unprecedented domestic recovery" effort in New Orleans and across the State of Louisiana (Godfrey 2009, 31-42)

- Obstacles and delays related to property owners' damage insurance claims
- Commingling assets and responsibilities for project implementation by the City of New Orleans
- Limited funding from the City of New Orleans for architects and engineers for project implementation, necessary to begin projects
- Inability of City of New Orleans to solicit bids or award contracts to begin construction, given lack of project funds
- Not enough licensed contractors to complete City of New Orleans and State of Louisiana rebuild

Many of these challenges necessitated changing local ordinances and/or state law as well as agency policies and protocols before the problems could be sufficiently addressed.

To a certain extent, recovery from Katrina in Louisiana and the City of New Orleans was doomed from the start. Relationships among relevant government actors to effect recovery was frayed. The Secretary of Homeland Security and the FEMA Administrator (not an emergency manager) at the time had a bitter relationship. Louisiana's Governor did not want to acquiesce any power to the federal government. The Governor, the Mayor of New Orleans and federal agents did not generate a coordinated front for a consolidated approach to recovery. Several state emergency managers ended up with convictions for the misuse of federal funds. Maybe

most significantly for the City of New Orleans, the then Mayor had moved his family to Houston several months before Katrina, waiting until Saturday, August 27, 2005 to initiate evacuation of city residents—just before the Monday, August 29, 2005 hurricane hit.

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On the other hand, the State of Mississippi experienced a different recovery process. After the hurricane hit, the Federal Coordinating Officer for the Recovery of the State of Mississippi and the state's long-time Emergency Manager, made an early, crucial decision to co-locate the federal office with the state office. In addition, Mississippi's Governor and First Lady travelled the state immediately after the disaster, reaching out to victims, responders, and emergency managers to express concern. The Federal Coordinating Officer and the State Emergency Manager quickly assessed a part of the recovery to be so difficult and wide-ranging that they asked Florida's Emergency Management Director at the time (who later became FEMA Administrator), to "adopt" four counties in southern Mississippi and to manage county recovery (Barbour, 2015).

Mississippi's very smooth and effective recovery from Hurricane Katrina is in large part due to the close, trusting and cooperative relationship between the different levels of government. Different from the administrative climate in Louisiana, where state and local officials jockeyed to control recovery efforts, those in Mississippi spoke with one voice, engaging a well-coordinated and supportive recovery. Then Governor Haley Barbour (2015, pp. 201-203) recognized the need for "one chief" of disaster recovery efforts (in spite of Mississippi's "weak governor" status) though this required other politicos to give up power:

> All these permutations [the work of the congressional delegation, collaboration of multiple team members and state budget maneuvering] came together to give me the authority needed to actually lead the recovery, rebuilding, and renewal. I will always be grateful to the other elected officials for recognizing and supporting the fact that someone had to be in charge, and the governor was the obvious choice.

Others took notice of Mississippi's collaborative approach. Brock Long, Alabama's Emergency Manager at the time of Katrina, observed how well Mississippi managed in the aftermath of the hurricane and during his later tenure at FEMA, initiated a program of co-locating FEMA officials and state emergency management officials in preparation for future disaster relief efforts.

Recognizing tremendous failures in FEMA's response to Katrina, Congress passed the Post-Katrina Emergency Management Reform Act (PKEMRA) in October 2006. The Act charged FEMA with responsibility for preparedness and a requirement to strategize for preparedness for all hazards, to strengthen integration of regional to local relationships, and to better coordinate with other federal offices. Three years later, the National Academy of Public Administration (NAPA) was tasked by Congress to assess PKEMRA. The final report recognizes a true shift in FEMA's role related to preparedness, especially its role to bring together all stakeholders to be prepared for disaster. "Because stakeholders possess most of the nation's emergency management resources and experience, FEMA must ensure that it not only engages these parties, but also develops effective working partnerships that improve preparedness" (NAPA, 2009, p. 2). Though the report acknowledges some progress by FEMA regarding its role, the study finds more work necessary for the agency. In particular, the report determines deficiencies that span external and internal to FEMA, including:

- Poor integration of preparedness mission across the agency
- Weak partnership with all stakeholders in pursuing national preparedness
- Lack of agency capacity regarding human resource management
- Lack of capacity of regional offices regarding national preparedness efforts

Even eight years later though, Dr. Patrick Roberts, speaking on a podcast produced by the National Conference of State Legislatures (NCSL, 2017) in the aftermath of Katrina agrees with the NAPA study regarding FEMA and its lack of capacity. Personnel-wise, "FEMA is a minnow in the whale of the Department of Homeland Security" (DHS) (NCSL, 2017). The agency accounts for about a tenth of one percent of DHS personnel, and media attention of DHS agenda—border protection, terrorism and the like can crowd out the FEMA agenda, he said (NCSL, 2017). This weakens the agency's ability to complete mission.

Earthquakes, floods and tornados

In research about the budgetary impacts of disasters on local governments, Dzigbede, Gehl and Willoughby (2019) explain what worked in various governments in the aftermath of floods (Binghamton, New York), a tornado (Tuscaloosa, Alabama), and an earthquake (Louisa County, Virginia), all occurring in 2011. Their findings indicate learning from the past regarding the need to pivot attention quickly and engage the whole community to pursue disaster relief and recovery. That is, pre-crisis budget themes in the three localities focused on health and education spending, expanding the industrial base, curbing pension costs and effective policing. However, during and after each crisis, local officials shifted their budget foci to emergency relief, federal and state aid, infrastructure repair and economic development.

Review of local council and commission meeting minutes in the three governments confirms that attention of budget actors swivels immediately to disaster response and needs assessment. Budget actors in Louisa County, Virginia, in particular, show an immediate and strategic focus on framing fiscal needs quickly specifically to secure external disaster relief funding. The Board of Supervisors meeting minutes from August 29, 2011 include a preliminary damage assessment totaling $17.5 million with "damage assessment teams out again tomorrow and the next day in an effort to see the 200+ remaining properties" (Louisa County, 2011, p. 2). Importantly, communication flow is front and center to effective response:

> [The Board Chair] met with the Governor last week, [U.S.] Rep. Eric Cantor came out to the County, and Ed Houck had visited. [The Board Chair] also said he had a conference call with [U.S.] Senator Warner, and all of these officials had expressed sincere concern about the situation but also emphasized that the process for assistance will work. [The Board Chair] indicated the County would need to send and prepare a lot of paperwork, statistics, and pictures to the State to help assess the total damage, noting the multi-million dollar damage [estimate]. He said the Governor told him personally that he would do everything he could for Louisa County and encouraged them to send the information to the State, with the Governor's office determining whether to forward it to the Federal government. [The Board Chair] expressed concern as to whether the residential property owners would be able to get assistance from Federal sources as well. He said that Senator Warner last Friday indicated that once the hurricane came up the coast, the earthquake in Louisa would become less of a focus, so he was concerned

> about the timing and encouraged the County to get information in as fast as possible (County of Louisa, 2011, p. 2).

Such discussion highlights efforts to quickly advance communications among levels of government to initiate an effective response. Further, the passage below illustrates the "all hands on deck" approach engaged by Louisa County which highlights responsibility-taking from the ground up that is required for a community to pursue real recovery in the aftermath of disaster:

> Mr. Byers said in working in the Emergency Operations Center, it was "quite interesting" to see all of the people from other counties offer mutual aid….Mr. Byers encouraged attendees to go back and talk to their churches to get them involved, as this was an excellent opportunity to get help from members of the community. "We've done our mission trips in different places. We need a mission here and there's a lot of folks who are going to discover more damage as we move through the months. Not all of it has been identified so far." He said school staff and administrative personnel have taken very proactive steps and have quickly gotten a handle on the issue, adding that there has never been this kind of experience before in the region but people responded really well. He added that there was an opportunity here to go back and see if there were any changes that could be made to make it better for next time, if there was one. Mr. Byers said the outcome here was nothing short of a miracle (Louisa County, 2011, p. 3).

Also relevant regarding Louisa County is that the costs for upgrading infrastructure and community building were already on the budget agenda (for example, needs surrounding the deteriorating high school) prior to the disaster. This supported government officials' ability to account for fiscal needs quickly in order to secure insurance and disaster relief funds efficiently. On the other hand, in Binghamton and Tuscaloosa, funding considerations for infrastructure and economic development were not on budget agendas or simply gave way to other priorities prior to disaster. In these two governments, the disasters (tornado and floods) themselves became the focusing event that shifted budgetary attention to infrastructure and economic development (Dzigbede, Gehl and Willoughby, 2019).

Crow and colleagues (2018) study learning on the part of seven Colorado communities in three counties in the aftermath of flooding in 2013, focusing on local government finance policy change. They find multiple finance-related barriers to effective disaster recovery (some highlighted above) including: 1) the strict documentation needed given complex and multi-party reimbursement assistance, 2) the need for local officials to mine all possible funding resources, over and above those from federal and state governments, and 3) the need for expertise and resources at the local level to start recovery immediately. Policy changes that occurred following flooding in these jurisdictions is indicative of learning, evidenced by policy changes made by the governments related to personnel, processes and organizational structuring for securing disaster relief funds. According to these scholars, "our findings indicate that local governments may be in a unique position to engage in political and instrumental learning—primarily focused on navigating relationships and processes with other actors—due to the pressures and constraints placed upon these governments by federal and state laws and agencies" (Crow et al., 2018, pp. 585-586).

After Katrina: Hurricane Harvey

By the time Hurricane Harvey hit the U.S. 12 years after Katrina, an "all hands on deck" approach to effective disaster response was a more common understanding among stakeholders. For example, Texas Lieutenant Governor Dan Patrick, speaking on the same NCSL podcast as Roberts in 2017 in the aftermath of the hurricane expressed that disaster relief and recovery is "a state's function primarily with the locals, and then you have to have the federal government there with FEMA" (NCSL, 2017). He recognized the heavy state role required to corral a complex network of federal, state and local governments "to make all of that come together in a cohesive manner" for a successful recovery effort. The Lieutenant Governor explained a number of factors important to successful disaster response, beginning with experienced leadership at all levels:

> ...with all the county judges particularly and sheriffs in a lot of these counties that I met with, many of them have been through many storms and they've all said the federal government has never done a better job of getting in quickly with aid through FEMA through their new director [Brock Long]….And I would say they've never done a better job (NCSL, 2017).

Patrick continued, mentioning other vital components for effective recovery, including having a savings account (a rainy day or economic stabilization fund) that is accessible for disaster relief *and* stocking it along the way, then preparation and training. "We've drilled and drilled and drilled" for emergency preparedness, he said (NCSL, 2017). Pushing such practices down to localities then becomes paramount.

Technological advancements in social media by this time allows researchers to leverage Twitter data in the aftermath of Harvey, generating incredibly rich results with the potential to inform highly effective emergency management strategies in future disasters. In the innovative study, engineers from George Mason University and Northeastern University track Twitter hits after the storm to assess disaster impacts on highways in Houston. The scholars (Chen, Wang and Ji, 2019, p. 9) explain the research contributions that span theory and practice:

> This study contributes to academia by (1) developing an effective and reliable mapping algorithm for identifying highway-related data from social media; (2) assessing disaster impacts on highways through a comprehensive analysis of social media activities; and (3) proposing a systematic approach for pipelining the assessment of disaster impacts on highways using social media. For practitioners, the assessed disaster impacts can provide a rapid and reliable awareness of highway situations for effective planning of relief and recovery efforts.

Wrap up this section with lessons learned with a few references to scholarship, experience…

Wildfires

TAKING ACTION TO EFFECT POSITIVE CHANGE

Clarify roles, expectations and legal responsibilities of all. We consider emergency management to be an eight-legged table requiring seats for federal, state, and local governments, NGOs, businesses, the insurance industry, the public and media. An ongoing conversation with all of these stakeholders and decision makers at the table supports better communication and more equitable voice about how to prepare for disasters, methods of navigating in the immediate aftermath of disasters, and tallying what can be learned from disaster relief efforts to advance future emergency management. Essentially, in spite of the ubiquity of natural disasters across the nation in any given year and evidence of learning, to date, confusion still exists when an event occurs as to who or which agency and/or level of government is responsible and for what. Roberts (NCSL, 2017) paints a picture of such confusion after disaster strikes:

> There's still an issue with people thinking that FEMA is the cavalry—that FEMA is going to come to the rescue. I even saw pictures on CNN of a woman saying: Why hasn't FEMA come to pick me up yet? I saw them picking up my neighbor. Why haven't they come for me and my pet? In reality it was the Florida National Guard; it wasn't FEMA. So people really turning to FEMA when it's first the neighbors who are the first responders, then localities, then the states and things like the state National Guard, and FEMA only later (NCSL, 2017).

Later, in his book about how politicians, bureaucrats and the public prepare for disasters, Roberts (2013) explains insights evidenced since Katrina, including the following:

- Changing laws and policies at all levels of government
- Leaders (the President and Congress) understand the need for experienced emergency managers
- Recognition of localities as first responders, rather than FEMA
- The influence and power of social media, to communicate as disaster strikes, in the immediate aftermath and beyond, to expose facts as well as to refute untruths

Given that roles, responsibilities and resources are continually defined and redefined over time, it becomes even more essential to improve understanding about such changes. NAPA can play a weighty role in building and sustaining vital conversation among those at the emergency management table.

Clearly communicate evolving roles, responsibilities and expectations. In defining responsibilities, clear communications are necessary to insure everyone understands what is expected. There can be no mixed messages. Proper emergency preparation guidelines often press that individuals should prepare for emergencies/disasters by having supplies sufficient to support themselves for at least three days. However, when a disaster strikes, the media, local leaders and many individuals affected immediately ask, "when will FEMA will arrive?" FEMA took a big hit with its response to Hurricane Maria in Puerto Rico when it hit there in 2017, especially regarding the restoration of power given that the electric infrastructure was barely performing before the storm. Late night "talk" show hosts joked that the recovery was slowed because FEMA personnel did not know there were regular flights to the island, were uninformed

as to the conditions there, and were unaware of what was actually needed on the ground. As noted earlier, New Orleans was woefully unprepared when Katrina hit, with recovery essentially becoming a complete federal initiative. Such responses lead to significant mission creep at the federal level, deep frustration at the state level, and extensive dissatisfaction at the local level. For example, during the Katrina response, there was a sudden call for citizens to receive ice as part of response materials. FEMA has long had an "ice mission", but historically this mission has been to provide ice to critical health facilities, like hospitals, in order to preserve medicines normally needing refrigeration. With Katrina, an expectation erupted that everyone should get ice for their personal use. In fact, much of the ice provided in the Katrina response was wasted as there was not official policy for individual/personal use in place.

Mission creep issues arose in 1996, after a two-week snow storm devastated the Washington, D.C. region. FEMA took over the entire disaster response and recovery responsibility. The mission of FEMA at the time was extensive and focused on emergency management, not preparedness:

> The mission of FEMA is to reduce the loss of life and property and protect our institutions from all hazards by leading and supporting the Nation in a comprehensive, risk-based emergency management program of mitigation, preparedness, response and recovery (Daniels and Clark-Daniels, 2000, p. 7 in reference to James L. Witt memorandum on Changes to FEMA's Strategic Plan, February 19, 1997).

Within FEMA there has been a long-held adage, "no dough for snow!" Snow removal and response was widely accepted as a local responsibility. However today, states routinely request and receive emergency and disaster declarations for winter storms, creating a costly mission creep in FEMA regarding federal snow storm response. This necessitates new budget, new routines, and broader appreciation and acceptance of the earlier consensus that major snow events should not be a federal responsibility. Combating mission creep requires broader understanding and acceptance by citizens and the media of the organizational working rule: no federal dough for snow.

By 2009, FEMA's mission, "to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards", recognizes necessary collaboration ("work together") and concern for preparedness. This statement begins to temper public expectations about roles and responsibilities. Today, FEMA's mission is simple and concise, "helping people before, during, and after disasters" (FEMA, 2018-2022, p. 7).

Manmade disasters: Confusing and complicating relief efforts

The incidence of manmade disasters further complicates disaster relief efforts. With natural disasters, the role of the federal government in preparedness, mitigation, response, and recovery, and how it interacts with state and local governments, while ever evolving, exists. As indicated above, lessons learned after each disaster result in adaptations in public programs, protocols, structures, and processes. FEMA indicates it takes an all hazards approach to natural and manmade disasters, but legally, incidents of mass violence are classified as crimes and responsible agencies with jurisdiction and funding for potential reimbursement are different than those with which state and local jurisdictions regularly work to address natural disasters.

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Manmade disasters of this sort create great confusion and uncertainty about the processes to follow when localities need to respond to and recover from acts of mass violence, especially during the recovery period. If the event is declared an act of terrorism by the FBI, then aspects of the incident are handled by the U.S. Department of Justice (DOJ) and the DHS. The federal government's role in recovery from acts of mass violence has been primarily situational, leaving traumatized local communities to figure out which agency is in charge, what assistance might be available, and whom to contact for help, unless the incident is of sufficient magnitude to warrant either a Presidential Declaration of Disaster or an Emergency Declaration. The President, with advice from FEMA, decides whether to provide or deny federal assistance in such instance.

To date, regarding incidents of mass violence, all aspects of the incident, including recovery, have been dealt with by the local jurisdiction unless higher levels of government exercise their discretion to assist. On December 2, 2015 in San Bernardino County, California, for example, a Public Health Department Environmental Health Services (EHS) worker opened fire on his fellow employees, killing 14 people, injuring 24 and traumatizing another 35. As of August 2018, the County had expended more than $24 million responding to or recovering from the attack, but only $2.06 million of that amount has been reimbursed by the state and federal government. This has placed most of the financial burden for this traumatic event wholly on the local government and its taxpayers in stark contrast to how the nation deals with disasters caused by weather, fire, and health problems. In cases of natural disasters, states and the federal government help to carry and spread the costs of preventing, preparing for, responding to, and recovering from exceptional, often tragic incidents.

Impacts and responsibilities of disease outbreak/contaminated water?—complicated, but FEMA involvement limited to none?

Impacts and responsibilities of ransomware attacks—localities totally on their own?

Emphasize preparedness by all—pre-disaster risk assessments, mitigation, and planning. Over time, the United States public has increasingly focused on the federal government as being responsible for everything related to emergency and disaster management after the fact. Federal grant programs have grown to support mitigation activities, in some cases, even including salaries for responders and construction of response facilities. Such expectations are fueled by media messages. For example, a recent article, republished in the NAPA daily email, includes the comment that everyone should do what the federal government says because they "know what's best." Consistent messaging that the federal government is responsible for all persons in this policy area, reduces expectations on the part of state and local governments, as well as individuals themselves, to take responsibility for their own actions. Certainly, federal funding for all emergency and disaster relief is abjectly unrealistic and completely unsustainable. Also, such thinking is the antithesis of a society that values individual responsibility and personal choice options for decision making and actions. This is incredibly important in the pre-disaster areas of mitigation and preparedness actions, phases of emergency management in which actions have the potential to dramatically reduce the costs and damages in the response and recovery phases.

FEMA's vision is "a prepared and resilient nation" (FEMA, 2018-2022, p. 6). Toward this end, the agency is explicit in its most recent strategic plan that disaster mitigation and response should be "federally supported, state managed, and locally executed" (FEMA, 2018-2022, p. 3), expressive of an "all hands on deck" approach to planning. The agency has established three strategic goals to 1) build a culture of preparedness, 2) ready the nation for catastrophic disasters, and 3) reduce the complexity of the agency. Building a culture of

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preparedness requires promoting "the idea that everyone should be prepared when disaster strikes" and to do this takes planning by the community of the whole—"we must all understand our local and community risks" (FEMA, 2018-2022, p. 4). To guide action in this regard, FEMA currently strives to make hazard mitigation the foundation of the national emergency management system.

This requires mitigation to be an individual and local responsibility. Building codes often allow existing conditions to continue that place individuals and communities at great risk should disaster strike. This is recognized prominently with flooding, where properties flood over and over again yet continue to receive insurance payments (from the federal government program). Using risk as a context for applying standards can provide more or less actions, with the goal to be consistent protection. Specifically, words matter and impact expectations in a way detrimental to emergency and disaster management policy. For example, the term "hundred-year flood" is highly misleading. This term miscommunicates an event with a one-percent chance of occurring every year, and leads to considerable misunderstanding of risk on the part of the public. That is, people are often complacent about flooding, as they consider a hundred-year flood as something that will not happen for another 100 years.

Thus, state and local governments as well as other stakeholders need to map vulnerabilities and follow through with pre-disaster mitigation and preparation. Recently, the NCSL (2019) recognized a study by the National Institute of Building Sciences that finds "every dollar spent on mitigation saves six dollars on future disaster losses." Efforts by FEMA and learning by states is bearing fruit—well over a third of states (19) have developed pre-disaster mitigation policies that include stronger building codes, studies on disaster risk as well as that related to intergovernmental/interagency collaboration (NCSL, 2019). How can NAPA help here?

Recognize climate change is a risk factor. Whether caused by CO2 emissions or solar radiation impacts from ozone depletion and other factors, weather events vary drastically and dramatically year to year and are becoming commonplace. This factor must be considered in risk assessments rather than relying solely on history or "compliance." We need more here and how can NAPA help?

Understand and communicate the impacts of development. More "stuff" means more exposure, more potential for loss. There are numerous reports and studies about the huge increase in disaster damage costs, but often such research does not put costs into context. Increases in population, housing density and hardscape development have occurred that aggravate the brutal effects of disasters of all sorts. Development has major impacts on hydrology and flood impacts, for instance. Ellicott City, Maryland, saw significant flooding two years in a row, and now a third. While there was significant rainfall in those events, there was little discussion at the time about the increase in road construction and development in the area that had significantly changed the hydrogeological conditions in the area. This is a substantial concern when reduction in wetlands occurs, too. How can NAPA help?

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Emphasize the importance of insurance by individuals and "rainy day funds" at all levels of government. A state official quoted above remarks about the need for states to maintain and consistently fund an emergency or rainy day fund to be able to access these resources in the event of a disaster. Likewise, an important individual responsibility is to ensure repair and

recovery of property after a loss; this is usually done by maintaining insurance. Flooding is a major cause of loss in many disasters, but a tiny fraction of properties are covered by flood insurance. However, if this could be transferred to industry to be included in general property insurance (like federal crime insurance in the 1970s), spreading actuarially-based premiums across the base would provide better funding (than subsidized premiums) and would be more affordable for all. Insurance companies presumably would have better leverage on development restrictions to protect flood plains, wetlands, and property generally. In addition, the current "FEMA flood map" and flood studies process to determine Special Hazard Flood Areas cannot keep up with development and its impacts at the local level. Essentially, flood maps are constantly becoming outdated. NAPA ROLE?

Establish a consistent reporting structure. There is no consistent reporting structure for natural disasters or emergency management outcomes in the aftermath of these events. There are fire and crime reporting structures, but emergency management does not have such a framework. Yet, substantial data regarding emergency and disaster management exists. An approach to determine critical information needed to make decisions, and mining current information to assess what data exists to meet that requirement must be developed. Working with state and local organizations, as well as NGOs and the insurance industry would be critical to this venture. Using the information framework, including its current (or potential) location, could be used to set a structure that allows for the consistent collection and sifting of data for effective emergency and disaster management into the future. Also necessary in data capture and mining, is the need to develop a consistent hazard and risk structure that communities could apply to make specific adjustments to plans and activities for development, mitigation, emergency response, and recovery. NAPA ROLE?

Establish emergency management data portal. Useful metrics, analytics, well-designed measured trials, and research are all critical for understanding progress, identifying problems, informing priorities, discerning patterns and relationships that may suggest program design improvements, detecting positive outliers to aid the search for promising practices, and detecting negative outliers as well as anomalies in need of further attention. Key to sorting out which activities most effectively and efficiently advance emergency management objectives is the collection, analysis, and sharing of data and analytics in ways that allow all levels of government and other stakeholders around the table to gauge progress, pinpoint problems, search for causal factors and develop solutions.

FEMA tracks, categorizes, reports, and analyzes trends in the personal and property costs of natural disasters. It also conducts after-action reviews of states and localities that have experienced disaster events to determine the causal factors associated with outcomes to identify and encourage adoption of the best ones and avoidance of the worst ones.

FEMA, states and localities also benefit when they measure and share other kinds of information. For example, federal, state and/or local governments could survey the public to determine the percentage of people who understand ***and*** comply with the tactic to keep resources on hand in order to shelter in place for at least three days in the case of disaster. Such data helps focus attention on the state of awareness and preparedness, particularly in high-risk areas. "Big data" analytics of public understanding about disaster preparedness, areas of confusion, and variations in patterns of geographic areas with the strongest and weakest levels of understanding about risks and how to prevent or mitigate them is certainly possible. In an age when scientists

are calling on the public to contribute to data collection to better inform research across all sorts of disciplines, so too, FEMA, states and localities can engage "citizen scientists" through online platforms to contribute to building and sustaining datasets regarding disaster prevention, preparedness, response and recovery. Social media has been and can continue to be mined for data that can inform the preparation for and response to disasters.

"Big data" analytics, working with the private sector, are also likely to be helpful for learning about disaster prevention, preparedness, response, and recovery. For example, tapping Zillow's data base, a New Jersey research organization recently undertook a study comparing home construction rates in flood zones to rates in other areas, finding a disturbing rise in construction rates in higher risk than lower risk areas (Flavelle, 2019). As Michael Lewis (2019) documents in *The Coming Storm*, the National Weather Service has been a pathbreaker not only amassing vast amounts of data but also sharing it with the private sector in increasingly creative ways that enable individuals, businesses, and government to make wiser, safer, and economy-boosting choices that are as varied as whether to take an umbrella, when to plant, and how much picnic food to stock on grocery shelves.

Engage NAPA in the call to action. NAPA has the capacity to bring the significant body of extant research that surrounds disaster and emergency management to bear for knowledge dissemination and learning across all communities in the country. Such capacity includes generating consistent conversation around the emergency management table through periodic 3panel discussions including experts/fellows to highlight what is happening on the ground level and to tease out how communities manage through disaster, effectively or not. NAPA capacity also includes sifting through substantial data and research that exists already and that continues to be produced to cull overarching strategies, laws, policies and protocols that best support effective, efficient and equitable emergency management across all phases—prevention, preparedness, response and recovery. Results from this component include white papers, reports, presentations and videos, with easy accessibility via the Web. The profession of emergency and disaster management is developing very rapidly, as there are over 600 programs in institutions of higher education offering degrees and certificates in Emergency Management and/or Homeland Security. NAPA fellows can be a ready source for lectures, speaking engagements and presentations to such institutions and programs to better inform students and practitioners about the state of the art of emergency and disaster management.

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