



Emergency and Disaster Management Case Study

**Standing Panel on Intergovernmental Systems
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EMERGENCY AND DISASTER MANAGEMENT CASE STUDY

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION
STANDING PANEL ON INTERGOVERNMENTAL SYSTEMS

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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 growing 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, to recover from. 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).

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.

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, a government ransomware hack, and/or the current, catastrophic global Coronavirus pandemic, 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 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, tribal and regional organizations 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 non-governmental 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, emergency preparedness drills, and continuity of operations, sustainability and/or resiliency plans that reduce the costs of recovery after disaster. However, 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, this case presents numerous examples of how emergency management strategies and disaster preparation and mitigation efforts have evolved over time and resulted in the development of principles and tools that can be engaged for better outcomes. For it is by 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 and 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 testimonies 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 mitigate 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, p. 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, pp. 31-42), including:

- 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 the 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 were frayed. Louisiana’s Governor did not want to acquiesce any power to the federal government and the federal government initially was unresponsive (Schneider, 2005). 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. According to one Parish president, “The bureaucracy has murdered people in the greater New Orleans area” (Schneider, 2005). Overall, leaders at every level of government lacked adequate

“sensemaking” of the impending disaster and its aftereffects. “Sensemaking requires organizational actors to recognize and find appropriate responses to new challenges” (Moynihan, 2009, p. 9). In addition to “sensemaking,” also required is a commitment to planning and practicing among intergovernmental partners well before any disaster occurs that could have a significant impact on a local, state, or regional level.

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, indicative of excellent federal-state collaboration. The 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. In addition, Mississippi’s Governor and First Lady travelled the state immediately after the disaster, personally reaching out to victims, responders, and emergency managers to express concern. (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. Whereas Governor Kathleen Blanco of Louisiana was unfamiliar with the Emergency Management Assistance Compact (EMAC) that supported mutual assistance for disaster recovery, Governor Haley Barbour of Mississippi was knowledgeable of it and corralled such support quickly and effectively (Waugh, 2007). 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 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 politicians 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 or "the Academy") 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 are both 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 Academy’s 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). Adequate funding remains an ongoing problem for FEMA today. The fiscal 2021 Trump Administration budget reduces FEMA’s budget by half a billion dollars for state and local grants and training that the Administration claims “are not federal responsibilities.” Among numerous FEMA programs that could be impacted, “the Flood Hazard Mapping and Risk Analysis Program would lose more than half of its budget, as the Administration argues ‘flood hazard mapping is not solely a federal responsibility’” (Johnson, 2020). Such constant fiscal stress 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 the importance of learning from the past as well as 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” (County of Louisa, 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 (County of Louisa, 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 procedure alterations made by the governments, hospitals and other entities related to personnel, processes and organizational structuring to better prepare for disaster. For example, in a briefing on hospital safety that recommends such preparations (2014), lessons learned from the Colorado experience include:

- Recognition that hospitals, in particular, will draw evacuees and those seeking rescue and recovery
- Facilities in flood plains must prepare barriers like concrete walls ahead of flooding to keep crucial areas dry
- Plumbing systems must be inventoried regularly; old systems become overwhelmed immediately in the case of flooding, rendering facilities dangerous and unusable
- Understand FEMA requirements for disaster recovery reimbursements; stay up to speed on what insurance covers as well as bidding and contracting policy requirements
- Use the power of social media to keep all informed
- Have experts, such as “industrialist hygienists”, on speed dial; keep a contacts list easily accessible

Research indicates “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).

Crow and colleagues' insight of the learning potential of local governments and impacts for effective disaster recovery is prescient, given results from the most recent International City/County Managers Association (ICMA, 2019) survey of local governments about their disaster resilience and recovery efforts. Results show local government actions indicative of learning, either through experience or knowledge of best practice. The survey finds that of the 901 responding governments:

- most experienced a federally declared disaster in the past five years
- most are familiar with state and federal disaster relief application protocols
- most have applied for aid from these governments within the past five years
- almost all (90 percent) have (or are developing) hazard mitigation plans
- almost all (98 percent) have public safety mutual aid agreements
- almost all (94 percent) have backed up data storage for key records
- over half have public works mutual aid agreements
- most have (or are developing) continuity of operations or standalone disaster recovery plans
- most have conducted a capital asset vulnerability assessment
- most have pre-disaster contracts for emergency management and debris removal

Still, there are areas which can benefit from local learning, as the survey specifies that:

- less than half of local governments have a sustainability or resiliency plan
- less than half have established pre-disaster contracts for temporary housing, building inspection or demolition
- less than half have conducted training exercises engaging post-disaster economic and community relief/restoration scenarios
- few have evaluated potential costs of debris removal or emergency protective measures should disaster strike
- few have agreements to support government payroll or information technology following disaster

Hurricane Harvey and flooding

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, as well as consistent 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.

To this last point, the impact of intergovernmental planning well before an event cannot be overstated. Planning, relationship building, and a mutual understanding across all governmental actors is critical to build the trust needed when a disaster occurs. For example, months before Harvey, the National Weather Service (NWS) worked with federal, state, and local emergency management officials to plan for such an event, a planning process much changed and improved since Katrina struck New Orleans and southern Mississippi in 2005. Leading up to Harvey, NWS began briefing emergency managers, and embedded staff in their operations centers a full week before landfall. This planning went a long

way to improve the intergovernmental response before, during, and after the event.

Technological advancements in social media by this time allowed researchers to leverage Twitter data in the aftermath of Harvey, too, generating incredibly rich results with the potential to inform highly effective emergency management strategies in future disasters. In an 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.

While past experiences and insightful research support knowledge building among all partners that can lead to smoother, better coordinated responses to disaster, past policies at all levels of government can keep these same partners in constant defensive mode. A recent decision from the U.S. Court of Federal Claims has determined that the U.S. Army Corps of Engineers did not forestall local development surrounding Houston area reservoirs behind dams built by the federal government almost 80 years ago. Following Harvey, the reservoirs overflowed and flooded hundreds of properties in these areas. The judge in the case ruled the federal government responsible for compensating land owners as “the 2017 flooding was intentional and constituted a ‘taking’ of private property under the Fifth Amendment to the U.S. Constitution” (Collier, 2019).

Wildfires

Wildfires are similar to, yet quite distinctive from, many other natural disasters, certainly regarding their management of relief and

recovery as well as government roles and intergovernmental relationships and responsibilities. Nonetheless, there is much about wildfire control that informs management of other natural disasters. Concerning prescribed wildfires, planned burns have been a legitimate part of forest management to benefit plant, animal and ecosystem sustainability. These burns are and can be managed for extended periods of time. Today, however, climate change accounts for more frequent and ever larger (unplanned) wildfires that are experienced across the nation. The costs associated with wildfire recovery in these instances grow, given increasingly dense development abutting forested lands. Researchers explain that the upward trajectory of more frequent and larger wildfires “will continue in response to further [global] warming. As a consequence, the wildland–urban interface is projected to experience substantially higher risk of climate-driven fires in the coming decades” (Schoennagel et al., 2017, p. 4582). These scholars claim this “new era of wildfires” necessitates “policies that promote adaptive resilience to wildfire, by which people and ecosystems adjust and reorganize in response to changing fire regimes to reduce future vulnerability” (Schoennagel et al., 2017, p. 4582). An adaptive resilience strategy of managing wildfires accepts climate-driven increases in wildfires, and develops convergent actions that coalesce ecosystem with community goals.

Wildfire management in California

The work of California's Department of Forestry and Fire Protection² (Cal Fire) offers a good example of the multifaceted aspects of modern wildfire management and where strategic, innovative, highly coordinated intergovernmental relationships have the potential to boost recovery results. The department espouses four goals in its most recent strategic plan: improve core capabilities, enhance internal operations, ensure health and safety, and build an engaged, motivated, and innovative workforce (California Department of Forestry and Fire Protection, "Strategic Plan - 2019 January", 2019). The 2018-2019 department budget funds 7,183 positions ("Natural Resources and Climate Change", 2018). These positions include permanent and seasonal wildland firefighters, Conservation Corps members, volunteers, and inmates (California Department of Forestry and Fire Protection, "Strategic Plan - 2019 January", 2019). Management follows strict chain-of-command to coordinate efforts, requiring that all crew have comparable training. This is difficult to achieve given the diverse range of skill sets among the different employees and often limited time to train employees prior to deployment. Department jurisdiction includes the state of California, supporting emergency services in 36 of 58 counties via contracts with local governments (California Department of Forestry and Fire Protection, 2019). California has 85 million acres of wildlands with 33 million of those consisting of forest. Thirty-eight percent of forest land is privately owned while the remaining 62 percent is tribal or government owned. Of the 85 million acres of wildlands, Cal Fire also oversees protection of 31 million acres of privately owned wildlands. The department responds to nearly 6,000 wildland fires that burn, on average, over 260,000 acres each year.

² This section draws from a management case authored by graduate students, Nira Marte and Tabitha Schwartz, in completion of the course, PADP 6960 Public Management, to fulfill requirements of the MPA degree at the University of Georgia, School of Public & International Affairs, Department of Public Administration and Policy in Athens, Georgia, Fall Semester, 2019.

In California, what was once a periodic wildfire season has stretched to a continuous, year-round one. Climate change, growing population density, and manmade³ events have contributed to the increasing frequency and intensity of wildfires in the state, making traditional techniques of containment woefully lacking. In the past, Cal Fire firefighters might anticipate the possibility of fighting a “once in a career” fire during their employment tenure, whereas today they might be fighting such wildfires for months, if not the entire year. In the last two decades, the state has confronted 15 out of 20 of the largest, most destructive wildfires in its recorded history (California Department of Forestry and Fire Protection, “Stats and Events”, 2019). Last year, the department spent over \$940 million on fire suppression; comparatively, in 1980, Cal Fire spent close to \$37 million in 2019 dollars.

Further squeezing departmental resources, federal land in California is managed by the U.S. Forest Service (USFS) through the Department of Interior (DOI) but the agency is often understaffed (Phillips, 2019). When fires breakout on federal lands, Cal Fire assists to manage them and prevent spreading. In spite of federal threats to cut back pay for such services, Cal Fire assists in these instances, having to cobble together staff and other resources in doing so (Phillips, 2019).

³ Such as the Camp Fire in Northern California that burned more than 150,000 acres and killed 85 people. The wildfire resulted from electrical transmission lines owned and operated by Pacific Gas and Electric (PG&E) (Gonzales, 2019).

In light of continued resource constraints and a “new normal” regarding the number and intensity of wildfires, the department seeks novel strategies to manage internally and externally going forward. For example, internally, the department engages inmates for basic wildfire management as this helps supply needed firefighters, given high burnout and the stress associated with firefighting year-round and in increasingly dangerous circumstances (California Department of Corrections and Rehabilitation, “Conservation (Fire) Camps”, 2019). Externally, the department seeks ways to better coordinate with USFS and other federal partners to anticipate wildfires and collaborate on methods of prevention, containment and suppression. Also, the department is working to transition public mindset from reactive to preventative thought—focusing on preparing forests, structures, communities, families and individuals for wildfires (ABC10, 2019). In this case, Cal Fire has developed a “Ready, Set, Go” campaign that citizens can access for information on proper structural requirements, action plans, and evacuation preparedness (ABC10, 2019). Cal Fire Chief, Thom Porter, notes that identification of safe routes for evacuation will assist in saving lives and enable wildland firefighters to respond quicker to containment of the fire (ABC10, 2019). Practicing these procedures with emergency services is another component of Cal Fire’s wildland management plan.

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.

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 January 2017, the attack cost the county \$22.6 million [approximately 11 percent of which has been secured in state and federal funding], with the largest costs stemming from the closure of county offices, mutual aid, contract staff for the division and real estate costs associated with temporary relocation and renovation of the facilities where victims worked” (Emerson and Rokos, 2019). Thus, most of the financial burden for this traumatic event rests with 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, while manmade disasters leave localities grappling solo or nearly so.

TAKING ACTION TO EFFECT POSITIVE CHANGE

The examples above indicate ever evolving strategies in preparing for, surviving and recovering from natural disasters. Such strategies benefit from ongoing learning on the part of individuals, flexible and mindful partners, and changing organizational cultures. The Disaster Recovery Reform Act of 2018 (FEMA, 2019) helps to move the nation forward by highlighting a “shared responsibility” for disaster response and recovery,

along with policy streamlining at FEMA that advances national capacity to face **any** future “catastrophic event”. As policy continues to evolve and considering the above cases, we suggest the following as strategies to improve intergovernmental relationships and effectiveness when engaged in emergency and disaster management.

Clarify roles, expectations and legal responsibilities of all.

Emergency management can be considered a table requiring seats for federal, state, and local governments, Tribal Nations and Native Communities, 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. Often, when a disaster strikes, the media, local leaders and many individuals affected immediately ask, “when will FEMA will arrive?” Roberts (NCSL, 2017) paints a picture of such confusion after a disaster event:

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).

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

It is important to repeat that there is often not a “one-size-fits-all” approach to disaster preparedness and response. State and local laws, the maturity of the decision makers involved, and the type and scale of the event are just some of the factors that determine the best methods for intergovernmental coordination. This is why it is critical to build trusted relationships within and across all intergovernmental levels well before events occur. Given that roles, responsibilities and resources are continually defined and redefined over time, it becomes even more essential to improve understanding about such changes. The Academy 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 or muddled information flows. For example, proper emergency preparation guidelines often press that individuals should prepare for emergencies and/or disasters by having supplies sufficient to support themselves for at least three days. Poor or ineffective streams of information impact emergency support services and so the ability to recover quickly from disaster. For instance, 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. An after-action report about FEMA’s response to Hurricane Maria indicates the agency lacked information before, during and after the storm.

“FEMA had little information in the first 72 hours on the progress of Maria as it ravaged Puerto Rico. A week later, it lacked information about the island’s water supply and available hospitals” (Adamczyk, 2018). Before Maria, “FEMA moved 80 percent of its emergency inventory from Puerto Rico to the Virgin Islands,” expecting the Virgin Islands as more likely to bear the brunt of the hurricane (Adamczyk, 2018). FEMA response problems in this case led the Agency Head at the time, Brock Long, to warn that “governments need to be better prepared with their

own supplies...and to be ready for the financial implications of a disaster.” San Juan, Puerto Rico Mayor Carmen Yulin Cruz criticized the Agency’s inability to learn from past mistakes and “better adapt [FEMA] operating procedures to Puerto Rico’s reality” (Adamczyk, 2018).

As noted earlier, New Orleans was woefully unprepared when Katrina hit, with recovery eventually 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 (National Weather Service, 1996). 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 costly mission creep in FEMA regarding federal snow storm response. This necessitates new budgets, 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 more comprehensive 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, further honing public expectations—“helping people before, during, and after disasters” (FEMA, 2018-2022, p. 7).

Relatedly, an increasingly important component to disaster preparedness and response is the ability for federal, state, and local governments to support community action networks. Neighbors are often first responders, and can help in many ways that governments cannot. For example, a Jefferson City, Missouri man offered an open invitation to his neighbors in a nearby mobile home park to shelter in his stone house during severe storms (Fox 4, 2019). In 2019, a tornado ripped through the mobile home park, but once hearing the tornado warning, many of those neighbors had already taken shelter in this man’s house. This relationship likely saved their lives. As government entities continue to be resource constrained, these action networks can help supplement intergovernmental efforts to build a “culture of preparedness”.

The National Weather Service (NWS) has gone a step further to directly connect with organizations through the Weather-Ready Nation Ambassador Initiative, weaving weather information into the fabric of local, regional, and national communities of decision makers to help support these action networks. This effort has improved awareness, preparedness, and responsiveness to extreme events across the nation. NWS is also finding that as corporate social responsibility becomes more important to consumers, more corporations are interested in becoming part of these community action networks (see, for example, the Walmart Super Bowl Ad: United Towns, 2020). While NWS has identified the Weather-Ready Nation Ambassador Initiative as a best practice, it is still learning how to best support and connect private, public and non-profit entities, and individuals across the United States to promote public safety.

Emphasize preparedness by all—pre-disaster risk assessments, mitigation, and planning. As explained above, 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 often are fueled by media messages. For example, 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 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 those related to intergovernmental/interagency collaboration (NCSL, 2019).

Recognize climate change is a risk factor, watch and study the weather and environment, and make research transparent.

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. Climate change and socioeconomic factors are reinforcing negative outcomes, as well. For instance, climate change will cause more severe droughts and wildfires. Insurance companies are beginning to raise rates in areas at high risk for wildfires. Poorer Americans, living in such areas but unable to afford higher insurance rates, will become more vulnerable to the next wildfire that hits where they live. Such factors must be considered in risk assessments rather than relying solely on history or “compliance.” The federal government should bring together its innumerable research capabilities and agencies to constantly track natural environment and weather changes and advance transparency of research and predictions. Scholars calling for adaptive resiliency in confronting wildfires referenced earlier determined, in effect, that human behaviors and public policies must adapt to an inevitably altering natural environment, evolving effected ecosystems, and in light of weather changes.

Understand and communicate that impacts of disaster mean a future forever changed. Increases in population, housing density and hardscape development all contribute to increased exposure and the potential for losses when disaster strikes. These trends aggravate the brutal effects of disasters of all sorts. For example, urban development has major impacts on hydrology and flooding effects as well as those from wildfires. Environmental changes following disaster often cannot be effectively brought back to “normal” or certainly to what existed before. Strategic thought must go into recovery efforts that adapt to new and forever changed environments. Such understanding must be continually communicated to all partners and communities, both pre-disaster and throughout the recovery process.

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 and 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 only a tiny fraction of properties is 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.

Develop and engage 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. Also, different federal agencies have different reporting requirements. 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. The federal government, 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 in to 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.

Establish an emergency management data portal. Useful metrics, analytics, well-designed measured trials, and research are all critical for identifying problems, understanding progress, 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, adjust plans, 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 rather than lower risk areas (Flavelle, 2019). As Michael Lewis (2019) documents in *The Coming Storm*, the NWS 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. Such choices are as varied as whether to take an umbrella, when to plant, and how much picnic food to stock on grocery shelves.

Engage the Academy in the call to action. The Academy 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 panel discussions including experts and fellows to highlight what is happening on the ground level and to tease out how communities manage through disaster, effectively or not. The Academy’s capability 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. In addition, two of the Academy’s grand challenges directly relate to this case: “Build Resilient Communities” and “Foster Social Equity.” Academy products relevant to this endeavor 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. Academy 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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