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HURRICANE KATRINA: CATASTROPHIC IMPACTS AND ALARMING LESSONS

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Hurricane Katrina:
Catastrophic Impacts and Alarming Lessons

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Abstract

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Hurricane Katrina was the most damaging catastrophe in U. S. history, with losses far exceeding those recorded for other U. S. disasters. At least 1,300 people were killed and many thousands were injured. More than six months after the hurricane, and with the 2006 hurricane season only months away, little progress has been made with respect to mitigation and reconstruction planning in the Gulf Coast region, and numerous victims remain displaced. Numerous lessons have been learned as a consequence of the Katrina catastrophe, and longer-term research promises to advance knowledge in the physical sciences, social and policy sciences, and engineering. This paper focuses on four issue areas that immediately became evident during and after the hurricane: the need for a greater recognition of the qualitative distinctions that exist among emergencies, disasters, and catastrophes; the need to view disasters and catastrophes from the perspective of vulnerability science; the need to recognize that the U. S. is not prepared for future catastrophic events, and that current plans constitute "fantasy documents" designed to persuade various audiences that government agencies are capable of managing future extreme events; and the need to understand and address problems associated with "elite panic" in the context of hazards and disasters.

Introduction

Hurricane Katrina now ranks as by far the most costly disaster in U. S. history.

We may never know how many lives were lost as a consequence of Katrina, but we do

know that Katrina is also among the most deadly disasters in modern U. S. history.

Katrina's devastating impacts were worsened by a sluggish and ineffective response by

all levels of government and by a lack of leadership on the part of high-ranking federal

government officials, including in particular the President and Department of Homeland

Security Secretary Michael Chertoff, but also including many officials who literally were

incapable of recognizing Katrina's catastrophic potential, not only before but also after the storm made landfall. This paper focuses first on facts and statistics that convey information on why this event was so catastrophic. It then moves on to discuss four key lessons learned from Katrina and the implications of these lessons for the nation's ability to manage future extreme events, including both natural disasters and other perils faced by U. S. society.

Recipe for Catastrophe: Katrina and its Impacts

Information about the Katrina catastrophe is now widely available, but nonetheless it is still useful to review basic information on the storm and its impacts. Katrina was the third major hurricane and the first category 5 hurricane of the 2005 hurricane season. It was also the sixth-strongest storm ever recorded for the Atlantic and the third strongest hurricane on record to make landfall in the United States. Katrina first made landfall in the U. S. as a category 1 hurricane north of Miami Florida on August 25, 2005. After gathering force over the Gulf of Mexico, Katrina slammed into Louisiana, Mississippi, and Alabama as a category 4 storm on Monday, August 29. The storm's path traveled just to the east of New Orleans. The storm surge from the hurricane covered over 200 continuous miles of coastline in the Gulf region, with heights ranging from 10 to 30 feet. Biloxi, Mississippi received a 30 foot surge, the highest storm surge experienced by a U. S. city in recorded history. The hurricane also gave rise to 36 confirmed tornadoes.

As of this time, it is still impossible to determine how many people died as a result of Katrina. Indeed, it may never be possible to fix that number with any degree of certainty. The official death toll indicates that 1,319 people died in the hurricane,

counting both landfalls. Eighty-two percent of those who were killed were from Louisiana. Initial analyses indicate that the elderly were significantly over-represented among those who died; for example, among those decedents who had been identified and examined in the St. Gabriel morgue in New Orleans, 67% were over 60 years of age, and 44% were over 75—far in excess of the representation of those age groups in the general New Orleans population (Bourque et al., 2006). Hundreds still remain missing as families continue their futile search to locate their loved ones. Recent reporting indicates that Katrina is still continuing to kill, with mortality rates assessed as especially high for the elderly and perhaps in particular nursing home residents that were forced to relocate.

Katrina was the deadliest hurricane to strike the U. S. since a Florida hurricane, the Lake Okeechobee Hurricane, killed over 1,800 people in 1928. The largest loss of life in any U. S. hurricane occurred in the 1900 Galveston hurricane, which killed an estimated 8,000 people. One report on Hurricane Katrina observed that "hurricanes with high death tolls mainly pre-date satellite monitoring and forecasting systems that were thought capable of preventing modern high-casualty events" (Risk Management Solutions, 2005: 3). Monitoring and forecasting systems in fact did a good job of tracking Katrina and predicting both its landfall in the Gulf region and its catastrophic impacts. Responsibility for the late and insufficient response to Katrina resides not with modelers and forecasters, but with the U. S. leadership.

Most of those who died as a direct result of the storm were from New Orleans and nearby communities—a metropolitan area that was then home to approximately 1.3 million people. The largest single contributor to the death toll in Katrina was the fact that the storm caused breaches in the levee system in New Orleans, causing water to flow

from Lake Ponchartrain directly into the city. Approximately 80% of New Orleans was flooded, and an estimated 100,000 people who had been unable or unwilling to evacuate were trapped in their homes and other locations around the city. It has long been recognized that New Orleans is essentially a bowl surrounded by bodies of water—the lake and the Mississippi River—and that only the levee system keeps the city from being inundated. It has also been recognized that the levee system itself was only strong enough, at best, to protect the city from a fast-moving category 3 hurricane. Indeed, the catastrophic impacts of a large hurricane striking at or near New Orleans had already been projected and well-documented.

With respect to injuries, the U. S. Centers for Disease Control and Prevention reported on October 14, 2005 that an injury surveillance system it had put in place for the Greater New Orleans area received over 7,500 health-related "events"—illnesses and injuries—during the period between September 8 and September 25. This includes both injuries to residents and to emergency workers (Centers for Disease Control, 2005). An epidemiologic study of those who were evacuated to the Astrodome in Houston—the overwhelming majority of whom were from New Orleans—found that 33% of evacuees had experienced health problems or injuries during the hurricane and resulting flood (Bourque et al., 2006).

The short- and longer-term mental health impacts of Hurricane Katrina are yet to be determined, but given the scope and severity of the event, as well as the mass displacement that occurred as a result of the hurricane, those impacts are expected to be large. Counseling programs funded by the Federal Emergency Management Agency as part of its Stafford Act responsibilities have been set up in twenty states.

Reports issued in fall of 2005 indicate that approximately 416,000 housing units were destroyed in Katrina, while 85,000 housing units suffered major damage. The hurricane disproportionately affected renters and low-income households. In a September, 2005 report, the National Low Income Housing Coalition (2005) estimated that overall, 47% of the dwellings that were destroyed were rental units (the proportion in New Orleans was higher—55%), and that 71% were what could be considered low income or basic "affordable" housing units. A more recent report also reveals that damage to and destruction of rental units was especially high in the city of New Orleans., and also that many homeowners (not the majority but a substantial minority) had no insurance to cover their losses (Department of Homeland Security, 2006; analyses for this report were carried out by researchers at HUD). The hurricane left an estimated 1,000,000 people homeless in what one report called "a humanitarian crisis on a scale unseen in the U. S. since the Great Depression" (Urban Land Institute, 2005: 5; see also Nigg, Barnshaw, and Torres, 2006).

Estimates of the economic losses produced by the hurricane vary, depending on how those losses are counted. The total insured losses from Hurricane Katrina have been estimated at between $40 and $60 billion dollars—with the $35 to $50 billion attributable to wind and storm surge during the landfall on the Gulf Coast and to the flooding in New Orleans. Total losses are expected to exceed $125 billion (Risk Management Solutions, 2005). This number includes only physical losses, not the full costs associated with providing relief and disaster recovery assistance to affected households, businesses, and communities. For the states of Louisiana, Mississippi, and Alabama, the U. S. Congress has passed two supplemental appropriations bills providing a combined $62.3 billion for

relief and recovery needs.[1]   The area affected by Katrina-related disaster declarations

spans 90,000 square miles, or an area almost the size of the United Kingdom, which

provides some idea of the geographic scope of the relief and recovery challenges. While

total losses from this disaster will no doubt rise, to date the assistance provided to the

region is only a fraction of what was promised.

The hurricane disrupted business and economic activity over a wide region. The

U. S. Department of Labor has estimated that there were approximately 163,000 business

establishments in the areas most affected by Hurricane Katrina and later by Hurricane

Rita. These establishments employed about 2.7 million workers (U. S. Department of

Labor, 2005). While some workers are continuing to be paid by their employers even

though those businesses are shut down, others are not. Still others have been offered

positions by their companies in other geographic areas.

In the aftermath of Hurricane Katrina, the U. S. and the Gulf Region face a set of

challenges associated with recovery, reconstruction, environmental remediation, and the

mitigation of future hazards that is perhaps the most daunting and challenging in U. S

history. Even the reconstruction of Galveston following the 1900 hurricane and the

rebuilding of San Francisco after the 1906 earthquake do not come close to the scale and

complexity of managing recovery in such a large regional disaster in which there have

been absolutely devastating and continuing impacts, and in which the challenges

associated with reconstructing communities that are both livable and safe from future

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[1] It is important to note here that not all of these funds will actually be disbursed in the impact region. This
total includes monies that will be transferred to other federal agencies, including in particular the
Department of Defense, to reimburse those agencies for expenses incurred during disaster response
operations.

disasters are so great. More than six months after Katrina, the region and its residents are still awaiting the help they so desperately need.

Katrina's Lessons

Research on Hurricane Katrina will add immeasurably to our understanding of both the causes and the consequences of catastrophic disasters. New projects that have been funded by agencies such as the National Science Foundation will provide insights on topics ranging from broad environmental impacts to the experiences of children who survive catastrophic disasters (for details on projects funded through the Hazards Center quick response program and through NSF, see the November, 2005 and January, 2006 issues of the *Natural Hazards Observer,* on line at http://www.colorado.edu/hazards). Results from the many studies that are being conducted on Katrina will become available as those studies are concluded. In this paper, I focus on four immediate lessons learned (or re-learned) following the Katrina disaster.

Size Matters

One important lesson that was re-learned is that emergencies, disasters, and true catastrophes like Katrina differ in very significant ways.[2] From a common-sense point of view, disasters are merely large emergencies, and catastrophes are just large disasters. Many people, including emergency managers and no doubt members of the general public, think this way. However, as the scale of severity escalates from routine emergencies, such as large auto accidents and major structure fires, to disasters, and then to catastrophes, both the impacts and the management challenges associated with

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[2] This discussion is partly based on theoretical discussions and publications from the field of disaster research—see, for example, Quarantelli (1996) and Perry and Quarantelli (2005).

response and recovery differ significantly. More important, these differences in scale are not merely quantitative; they are also qualitative.

In emergencies, responding agencies are generally from the local area, agencies follow standard operating procedures, impacts tend to be localized, and emergencies are typically brought under control without the need to request aid from higher levels of government. Emergencies generally do not result in major degradations of emergency communications and emergency management infrastructural elements, nor do they occasion a large outpouring of aid and assistance from the residents of the communities in which they occur; instead, things are handled by uniformed first responders, such as fire, police, and EMS service providers.

In contrast, disasters, by their very definition, are events that cannot be handled solely by local emergency response agencies. Mutual aid and the provision of assistance from state and federal government levels are necessary. Resources needed for the smooth operation of crisis response systems may be rendered non-operational or even completely destroyed—as occurred, for example, following the WTC attack when New York City lost its emergency operations center, or following Hurricane Andrew in 1992, when the emergency management system was rendered almost useless. In disasters, members of the public immediately become involved in the disaster response, performing important tasks such as emergency search and rescue, as we saw, for example in the 1985 Mexico City earthquake, Loma Prieta, Northridge, and many other earthquake events (Tierney, 1994). Public involvement is so extensive because even in what would be considered severe disasters, the "impact ratio" is such that there are more many more survivors than victims.

In disasters, interorganizational and intergovernmental co-ordination challenges are orders of magnitude larger than they are during routine emergencies. Local responders must work with counterparts from other jurisdictions and the state and federal government with whom they may never have had previous contact, as well as converging resources and volunteers, a situation that often results in confusion, turf battles, and time spent on working out roles and responsibilities. Much more so than emergencies, disasters always contain an element of the unexpected: challenges continually develop that require re-thinking, re-direction of resources, creativity, and improvisation. Unlike smaller-scale emergencies, disasters cannot be run by the books, because new problems continually develop.

Catastrophic events have fortunately been very rare in U. S. history, although they have not been uncommon in other societies. Globally, there have been a number of truly catastrophic disasters in the last hundred years, including the 1923 Great Kanto earthquake and fire in Tokyo, which killed an estimated 143,000 persons; the 1976 Tangshan earthquake in China, which resulted in approximately 250,000 deaths; the tropical cyclone that struck Bangladesh in 1970, which caused at least 500,000 deaths; and, more recently, the Indian Ocean earthquake and tsunami catastrophe of 2004. (see Noji, 1997 for statistics on disaster mortality and morbidity). Here in the U. S., probably only three events warrant classification as genuine catastrophes: the 1900 Galveston hurricane, the 1906 San Francisco earthquake and firestorms, and now Katrina.

Catastrophes can be distinguished from disasters along several dimensions: there are extremely large physical and social impacts; large areas are affected; there are many deaths and injuries, proportionate to survivors in the impact area; and property and

infrastructural damage are very severe and extensive. Additionally (and this is key), the systems that normally support social and economic life are destroyed. The formal emergency response system is paralyzed, both because of overwhelming demands and because the system itself lacks the resources to operate. Because the formal aid system in the impact region is not operating, much more help is needed from the outside. At the same time, it is extremely difficult to deploy those resources once a catastrophe has struck, owing to the sheer damage and disruption catastrophes cause.

Catastrophes thus present their own unique challenges. However, what they have in common with disasters is that community residents still rise to the occasion and help one another—even when impact ratios are very high. Because this is the case, the informal or non-governmental sector has a large initial role to play, particularly in the initial response to catastrophic events. The consequences of catastrophes are extremely severe and complex. Such events typically produce massive and unanticipated cascading problems—such as the environmental contamination and public health hazards that are now coming to light in the Greater New Orleans area.

These distinctions are not merely academic. They have very important implications for policy and practice. For example, at the most fundamental level, such qualitative differences in response requirements remind local governments that just because they can handle everyday emergencies, that does not mean that they are capable of responding effectively to major disaster events, disasters, and near-catastrophic and catastrophic events. Further, these contrasts show that standard procedures for initiating and carrying out response activities during disasters will not be effective for the management of catastrophes.

At the national level, it now appears that in the aftermath of Katrina, federal officials are beginning to realize that the kinds of situations that the National Response Plan (NRP) terms "incidents of national significance" and "catastrophes"—designations that the plan's authors clearly meant to apply to terrorism-related events—can also be triggered by natural disasters. Unfortunately, because this threat was not recognized by the President and other high-level officials, Katrina was not even designated an "incident of national significance" until August 30, the day after the hurricane made landfall. Under existing plans and policies, nothing prevented the federal government from initiating a response even before Katrina made landfall—nothing, that is, except its own inability to grasp that Katrina was a catastrophe (not a disaster) in the making.[3]

Social Inequality Matters

Traditional and common-sense perspectives on disasters see those events as "acts of nature" or "acts of God" that produce random effects and victimize the rich and poor alike. In contrast, recent theoretical formulations derived from the emerging interdisciplinary paradigm known as vulnerability science, conceptualize disasters and catastrophes as occurring at the nexus of three sets of conditions: physical vulnerabilities rooted in the "hazardousness of place," including vulnerabilities associated with both event frequency and severity and the fragility of the physical environment and ecological systems; the vulnerability of the built environment in at-risk regions, which is associated with land-use practices and building practices; the physical condition of buildings and infrastructures; and social vulnerability, as indicated by such factors as income, wealth,

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[3] Both the framework for declaring events "incidents of national significance" and the Catastrophic Annex of the National Response Plan give the federal government wide latitude for mobilizing response resources without requests from local or state governments. Broadening the power of the federal government to pre-empt lower jurisdictions was seen as important for waging the so-called "war on terrorism."

ethnicity, age, citizenship status, ability to adopt self-protective measures, and social and cultural capital (see Blaikie, et al., 1994; Cutter, 2001; Cutter, Boruff, and Shirley, 2003; Cutter, 2005). As summarized by Cutter (2005), social vulnerability is related to such factors as "the basic provision of health care, the livability of places, overall indicators of quality of life, and accessibility to lifelines (goods, services, and emergency personnel, capital, and political representation." Seen in this light, social vulnerability to disasters is yet another manifestation of inequities that exist in other realms of social life, including differences in access to safe and secure housing, health care, and educational opportunities; in political power and influence; and in the ability to exercise agency and choose among various options in making life decisions.

These connections were widely discussed in the research literature long before Katrina (see, for example, Peacock, Morrow, and Gladwin, 1997; Bolin, 1997; Enarson and Morrow, 1998, Tierney, Lindell, and Perry, 2001; Tierney, 2005), but it took Katrina to vividly demonstrate the meaning of social vulnerability before the entire world. Katrina dramatically revealed the differential impacts and experiences that result from the juxtaposition of place-based vulnerability, infrastructure fragility, and large differences in the options available to individuals and groups, based on their positions in the social order. Southern Louisiana in particular was highly vulnerable virtue of its location and environmental characteristics (e.g., continual loss of barrier islands and wetlands). The survival of New Orleans was dependent on a levee system that turned out to be too fragile to survive a category 4 hurricane without experiencing cascading failures. With respect to social vulnerability, axes of diversity such social class, age, race and ethnicity, and gender structured both life-chances and the assistance that was made available to

hurricane victims. To cite just a few obvious examples, social class was one factor

determining whether those at risk were able to evacuate. When mandatory evacuations

were ordered, those with automobiles and cash and credit to purchase gasoline and hotel

rooms were able to act on those orders more readily than those without transportation and

financial resources.[4] Age was clearly another factor. Elderly persons typically have

strong attachments to place and are averse to changes in their daily routines—even if

those changes may enhance their safety and quality of life. For those reasons, elderly

residents were overrepresented among Katrina's "holdouts"—and also overrepresented

among the dead. Race and gender were also associated with differential treatment by

officials charged with managing the catastrophe; African Americans, and particularly

young black males, were heavily policed and labeled as potential safety and security risks

in the aftermath of Katrina. Those who were trapped and desperate following the flooding

of New Orleans—mainly the poor, people of color, and persons with disabilities and

medical problems—were left to fend for themselves as response personnel focused on

looting and lawlessness (see discussion below). Once survivors reached emergency

shelter facilities such as the Superdome, they were under constant surveillance, and their

movements were restricted. Initial observations by quick-response researchers indicate

that in at least one temporary shelter, located at a military base in Arkansas, blacks and

whites were segregated, and armed guards patrolled the shelter in order to "maintain

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[4] It should also be noted that the mandatory evacuation was issued later than it should have been. In his recently-published book *Come Hell or High Water* (2006) Michael Eric Dyson reports that New Orleans mayor Ray Nagin delayed issuing the mandatory order by as much as one full day owing to pressure from business interests. Nagin faced a dilemma that is common in hurricane evacuation situations: if he issued an order early, allowing sufficient time for people to evacuate, he would have faced criticism from the business community if the storm missed New Orleans or was less severe than predicted. If he waited until predictions became less uncertain, there would be insufficient time for those left in the city to evacuate. Nagin chose the latter course. In the meantime, residents who had the means to evacuate left voluntary before the mandatory order was issued.

order." Interviews with shelter residents indicate that while whites appreciated the heavy police presence because it made them feel safe, blacks felt criminalized and humiliated (Austin and Miles, personal communication). When transportation could be arranged, displaced residents were then relocated, evidently without their consent, to other sites around the U. S. for additional emergency shelter and temporary housing.

It is clear that social class and other social capital factors will also structure individual, household, and neighborhood recovery trajectories in the aftermath of Katrina. Six months after the hurricane, large numbers of former New Orleans residents are being prevented from returning to their homes and neighborhoods, both by official order and by the fact that utilities have not been restored in many parts of the city, such as the predominantly black 9th Ward. The strategies used to provide temporary housing for those lacking other housing options, such as providing support so that victims could live in hotels (and then withdrawing that support) and providing trailers and building trailer parks that are totally lacking in amenities, have become national scandals. One can only conclude that such measures are intended to discourage and demoralize poor evacuees and to prevent the formation of social groupings capable of advocating on behalf of these victims, with the goal of ultimately forcing them to give up their hopes of returning to their homes.[5]

Preparedness versus Planning Fantasies

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[5] A March report in the *New York Times*, which focused on one particular trailer camp, argued that the camp was designed and laid out specifically to make residents feel uncomfortable, so that they would try to leave, rather than settling down in the camp. Trailers were crammed together, and no space was provided for community meetings or playgrounds. Residents of the camp finally began complaining vigorously when FEMA decided to stop permitting religious services in the camp. That order was later rescinded. That better-off disaster victims would be treated in these ways is inconceivable.

A third lesson learned as a result of Katrina is that the nation in fact has no effective plans for responding to catastrophic events. The U. S. does have the NRP, and that plan does have a Catastrophic Annex (see Department of Homeland Security, 2004).. However, those plans were unfortunately not developed with guidance from physical or social scientists, disaster policy experts, or experienced emergency managers. Instead, they reflect the work of non-experts, consultants, and bureaucrats who were pressed hard to produce documents indicating that the nation can manage future terrorist events. On paper, the Catastrophic Annex does provide a degree of guidance, but the Annex, like the NRP itself, simply reiterates what DHS *wants to do and wants to accomplish* during very large scale events. Full of operational detail but short on strategic and policy elements, the response scenarios laid out in those plans assume that those in charge, including in particular the DHS Secretary and the President, will actually recognize a catastrophic or potentially catastrophic disaster when they see it. That certainly did not happen before, during, or after Katrina. Additionally, in federal planning initiatives, the concept of catastrophe is closely linked with chemical, biological, and nuclear weapons of mass destruction.. Because funding opportunities for states and local communities closely track federal concerns, it is perhaps understandable that response agencies at all levels of government read federal signals and adjusted their plans and activities to focus increasingly on the terrorist threat. Currently planning initiatives at all levels are almost entirely focused on the terrorist threat, despite the fact that the NRP and its annexes do occasionally mention earthquakes and other natural disasters as potentially catastrophic. Far more important to the planning and preparedness establishment was the fact that, of fifteen different scenarios for which all governmental agencies are required to plan

pursuant to Homeland Security Presidential Directive #8 and the National Preparedness Goal, thirteen involve various forms of terrorism as well as other exotic threats. Planning to manage the two natural disasters on the list, hurricanes and earthquakes, must have seemed far less challenging than developing plans and training and exercise scenarios for other threats on which all levels of government were required to focus, which included attacks using chemical, biological, radiological, nuclear, and explosive (CBRNE) agents, as well as cyberterrorism and pandemic flu. Further research is required, but in Katrina's aftermath it seems highly plausible that DHS leaders like Chertoff, a former Justice Department lawyer, may have considered the problems associated with catastrophic disasters "solved" through earlier planning.

Gilbert White, Professor Emeritus at the University of Colorado and founder of the Natural Hazards Center, is known for having often told struggling doctoral students that "the best dissertation is a done dissertation." So too with plans for controlling large-scale and catastrophic events. In Homeland Security Presidential Directive #5, the President ordered the development of the NRP, and the bureaucracy obliged.[6] In due course, the plan was developed and published in final form December, 2004, over the signature of former DHS Secretary Tom Ridge. However, it is unclear how many officials who were assigned responsibilities in the NRP had actually read and understood the plan as the nation entered the 2005 hurricane season.

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[6] Following the promulgation of Homeland Security Presidential Directive #5, funding for the development of the NRP was originally provided through a no-bid contract to the RAND Corporation. Initial drafts of the plan were widely criticized by experienced emergency managers and disaster and homeland security specialists. This pushback occurred despite to public relations campaign to "sell" the document to various constituencies. The NRP ended up being developed with significant input from federal officials.

Readers will perhaps by now have recognized the relevance of Lee Clarke's work on fantasy documents for understanding the NRP and other planning initiatives. During his research on the 1989 *Exxon Valdez* oil spill, Clarke first recognized that aside from whatever else they may seek to accomplish, organizational and government plans have symbolic and rhetorical value After closely studying the plans developed by oil companies and other entities responsible for oil spill management in the aftermath of the Exxon spill, Clarke recognized that such plans were designed to convey to outside audiences, including regulators and the general public, that catastrophic oil spills such as the *Exxon Valdez* can be successfully controlled—a claim that is at variance with what is actually known about such spills. Later, in *Mission Improbable: Using Fantasy Documents to Tame Disaster* (1999), Clarke made the case even more strongly, analyzing planning for such events as nuclear war and major nuclear power plant accidents. Clarke's main point is that plans for such events must be understood as a form of rhetoric and persuasive communication, and that their purpose is to convince audiences that organizational entities have the capacity to control situations that by their very nature cannot be controlled, at least given the state-of-the-art and the state of practice. Thus plans exist for cleaning up vast amounts of spilled oil in places like Prince William Sound, even though doing so is a practical impossibility. The NRP and related documents serve the same purpose for terrorism and catastrophic disasters.

Particularly in the period following the September 11, 2001 terrorist attacks and at a time when the threat of pandemic flu looms large, the demand for plans to manage large-scale and unfamiliar threats has expanded. In an overheated post-9/11 atmosphere of fear, the credibility (if that term can now be used) of the federal government rests upon

its ability to appear prepared for any eventuality. The National Response Plan itself was part of that effort; although the federal government already had a plan for coordinating federal resources in major disasters, called the Federal Response Plan, that plan was scrapped following 9/11. The new federal plan for pandemic flu is also a model fantasy document: it discusses in great detail what the Administration and the Department of Health and Human Services *want to see happen and want others to do* (and the directives are endless and bewildering), while giving little indication of what is likely to happen during an actual or threatened flu outbreak. There are currently no data on what is actually being done, either at the federal level or at other levels, to address the numerous requirements outlined in the plan. Nonetheless, its existence signals that the federal government and HHS have the pandemic flu threat under control.

Elite Panic and Its Consequences

Fourth, we know from decades of research that panic on the part of the public is extremely rare in disaster situations of all types, including catastrophic events. The virtual absence of public panic has been documented again and again in studies of all types of disasters, most recently and notably in the National Institute of Standards and Technology (NIST) investigation of building occupant behavior in the World Trade Towers at the time of the September 11, 2001 terrorist attacks (NIST, 2005). While the danger of *public panic* during disasters and catastrophes is not a problem, the danger of *elite panic* is. Particularly in the aftermath of Katrina, there is growing evidence that the threat of elite panic, especially in the face of very large-scale disaster events, is very real.[7] Disasters and in particular catastrophic events disrupt the social order in major ways,

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[7] The concept of elite panic has been discussed in presentations and draft papers by Lee Clarke and Caron Chess.—see, for example the unpublished paper "Elite Panic: A Neglected Concept."

making elites very uncomfortable because they fear a loss of control, and also a loss of legitimacy. And there is at least some evidence that they should have those kinds of concerns. Both the Somoza dictatorship in Nicaragua and the dominance of the Institutional Revolutionary Party (PRI) in Mexico were undermined owing in part to citizen discontent over government mismanagement following major earthquake events (Olson and Drury, 1997; Olson, 2000).

Major disasters and impending threats fuel elite panic on both local and national levels. Such panics take a variety of forms, including pathological fear of social disorder and of segments of the population that are not part of the elite; a rampant desire to protect private property; and post-event efforts to identify and punish scapegoats hastily usher in new "reforms." Elite panic was shockingly evident during Katrina, as evidenced by media and public officials' obsessions with looting and lawlessness, the issuing of shoot-to-kill orders, arising primarily out of a concern with property crime; and the rush to act upon rumors that circulated regarding the "savage" behavior of lower-class community residents, immigrants, and people of color (Tierney, Bevc, and Kuligowski, 2006). Although many of the media reports and official actions undertaken in response to Katrina in New Orleans seem reprehensible now, at the time they made sense to many Americans. Episodes of elite panic during disasters are in fact nothing new. In his recent book *The Great Earthquake and Firestorms of 1906* (2005), Philip Fradkin provides detailed accounts the draconian measures undertaken against the poor and people of color by government and civic leaders during the 1906 earthquake, the 1871 Chicago fire, and the 1900 Galveston hurricane. Following the 1906 earthquake, for example, "shoot-to-kill" orders were immediately given to control those labeled as looters; such orders

tended to be carried out against poor and working-class earthquake victims. At the same time, as Chinese residents fled the city only to find themselves segregated in camps far away from white victims of the earthquake, well-off men and women, as well as soldiers, looted Chinatown and took away statues, china, antiques, and other valuable goods [8]. Fradkin's accounts of the vicious rumors that spread following the 1906 earthquake— rumors about so-called "ghouls" who severed the ears and fingers of the dead in order to get their jewelry, for example—resonate a great deal with the tales of murder and rape that spun out of control in Katrina's aftermath. When she called off emergency rescue operations on September 1, 2005, so that public safety agencies could devote all their attentions to looting, and when she warned that looters would be shot by seasoned Iraq war veterans who were patrolling the streets of New Orleans with their weapons locked and loaded, Governor Blanco of Louisiana was not only acting illegally; she was also acting much in the same way as her predecessors who had faced catastrophic disaster events.

By essentially making being a disaster victim in New Orleans a crime (indeed, a crime punishable by death), these kinds of actions further hampered the response and further contributed to the misery victims were experiencing. How many lives were lost in New Orleans while rescue workers sought to put down looting? How much resident-to-resident helping behavior was prevented or suppressed because people were afraid to venture out to help their neighbors out of fear of being killed or arrested? These are the tangible, measurable consequences of elite panic in the face of catastrophe.

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[8] It should be noted, however, that even in this case the looting was short-lived, and while no measures were taken initially to prevent the looting of Chinatown, it was clear that many San Franciscans disapproved of this behavior, and the looting ultimately stopped.

Scapegoating, another form of elite panic, also took hold immediately following

Hurricane Katrina. Michael Brown, the FEMA director, was an obvious target, even

though new policies and plans such as Homeland Security Presidential Directive #5 and

the NRP clearly assign ultimate leadership responsibilities in major crises to the DHS

secretary, rather than the FEMA director. First relieved of his post and later forced to

resign, Brown was denounced as incompetent and unqualified, demonized by the same

government officials that were responsible for his appointment in the first place, and

made the brunt of numerous satires by cartoonists and late-night comedians. Meanwhile,

others whose egregious errors contributed to the Katrina response debacle were allowed

to resign quietly,[9] and many DHS officials continue to hold high-level positions for

which they are unqualified.

Elite panic is also evident in the post-Katrina "search for answers" and the

"search for solutions"—marked, for example, by Congressional hearings carried out by

the Homeland Security and Government Affairs Committee and various investigations by

the Select Bipartisan Committee (2006), the White House (2006), and other agencies..

From the point of view of rhetoric and symbolism, but not necessarily from the point of

view of bringing about real change, such investigations must be done, and done quickly.

"Lessons learned" must be incorporated into new plans before this year's hurricane

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[9] For example, Matthew Broderick, head of the DHS Operations Directorate and the Homeland Security
Operations Center (HSOC), has resigned effective March 31, 2006, following the House of Representatives
report on Katrina, which singled him out for failing to inform high-level officials of Katrina's devastating
impacts. Broderick, who was the person in charge of HSOC, which has been billed as the high-tech "nerve
center" in the battle against terrorism, based his judgments on the severity of the hurricane on CNN
footage that showed revelers in the French Quarter, even though he should have known that 80% of New
Orleans was under water.

season, if possible.[10] At least that is the mindset in Washington—just as the passage of

the PATRIOT Act had to take place immediately following the 9-11 attacks. Despite

calls by the disaster research community for an independent, objective, non-partisan

scientific investigation of the Katrina debacle, reports generated by these "investigations"

are in themselves fantasy documents. The White House report quibbles over where to

put the deck chairs, recommends measures that emergency management professionals

have been doing for years, charges federal agencies to do what they are already supposed

to be doing, and argues for an expanded role for the military in disaster response—a

recommendation that is without any empirical foundation (on this last point, see Tierney

and Bevc, 2006). The report of the Select Bipartisan Committee (which was essentially a

Republican Committee, because many Democrats chose not to join) is much more

detailed—and more damning—but again there is a perceived lack of independence from

governmental institutions that makes this report less compelling than it could be.

This is not to argue that inquiries like these, or the many other inquiries that are

being undertaken by the entities such as the Army Corps of Engineers and the American

Society of Civil Engineers, regarding the levee breaks, are useless. Rather, the argument

is that in many cases they constitute only symbolic measures that are meant to stave off

harsher criticism and make the public feel that national leaders are once again in control

and that the systemic problems Katrina exposed are being fixed. These kinds of "lessons

learned" documents can result in sound recommendations as well as symbolic ones. The

key question is whether those recommendations that are sound will lead to action and

change. The 9-11 Commission recently criticized governmental agencies for failing to

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[10] Among the modifications to the National Preparedness Goal that are currently underway is an expanded emphasis on crime and looting.

follow through on its recommendations for improving homeland security. Looking at other post-disaster "lessons learned" documents does not inspire confidence either. After Hurricane Andrew, for example, the National Academy of Public Administration conducted an independent investigation of the poor governmental response to that disaster and what needed to be done to avert future debacles (National Academy of Public Administration, 1993). That report, published in 1993, said among other things— and these are essentially quotes—that:

- the President should have a domestic crisis monitoring unit to assure that the federal responses to catastrophic events are timely, effective, and well coordinated;
- FEMA was like "a patient in triage" that should either be treated or left to die;
- FEMA could only play its appropriate role in disasters if the White House and Congress took significant steps to make it a viable institution;
- the only political appointees in FEMA should be the director and deputy director, the agency should develop a competent and professional career staff, and FEMA should have a career executive director;
- an all-hazards approach should be taken to the management of extreme events;
- FEMA and emergency management were overseen by too many Congressional committees; and
- the military should not be assigned a greater role in domestic disasters and crises

Where was the nation at the time of Katrina with respect to recommendations like these?

Concluding Questions

Six months after Hurricane Katrina, little is known about the fates of those who lost their homes, livelihoods, and loved ones as a result of the hurricane. There is no meaningful plan in place for carrying recovery activities on a scale commensurate with Katrina's devastating impacts. Questions remain regarding the longer-term psychosocial impacts and environmental impacts of the hurricane, as well as about the ability of the

tens of thousands who have been displaced to put their lives back together against all odds. Major issues regarding future hurricane and flood mitigation, rebuilding and reconstruction, and the provision of appropriate and affordable housing remain to be addressed. Recovery processes in the Gulf region will unfold over time, and those processes must be documented. If past research is any indication, those processes will themselves be shaped by exactly the same political-economic pressures and social inequities that characterize "normal life" in this nation. Outcomes will be uneven across different social units, and many will never recover. Politics will play a powerful role in who gains and who loses as a result of the hurricane, and disaster-stricken communities will change in ways that it is not yet possible to envision.

The preliminary discussions presented here raise a number of troubling questions. Those questions center on risk, safety and security, future threats, and disaster and homeland security policy. The following is a short list of questions that should be addressed by both researchers and the public policy community:

- If the nation could not ready itself to respond to a familiar and seasonal hazard (a hurricane) for which there were days of notice, what are the implications for suddenly-occurring disasters (e.g. a 7.0 earthquake event on the Hayward fault) and for exotic and unfamiliar threats?

- With the confidence of African Americans, other minorities, and the poor so seriously undermined as a consequence of Katrina, what are the implications for trust in government and in "official" information sources in future potential crises, such as pandemic flu and terrorist attacks? Can credibility that has been lost be regained? If not, what are the consequences for diverse communities at risk?

- How will key institutions respond to the so-called "lessons" of Hurricane Katrina? What new initiatives will be put in place, and whose interests will they serve? To what extent will the wrong lessons be learned and incorporated into planning for future incidents of national significance, e.g. lessons concerning looting, lawlessness, and the need for strict social control (and indeed military control)? Will ideologies associated with the war on terrorism, such as militarism, increasingly permeate plans for managing such incidents?

- What will it take for policymakers to recognize that principles of environmental justice and injustice are also relevant with respect to hazards and disasters? How can equity concerns be addressed in hazard and disaster management programs and activities?

- And finally, what new surprises will the 2006 hurricane season bring? Will the Gulf region be victimized once again? Will the federal government, with the assistance of the Northern Command (NORTHCOM) immediately federalize and militarize responses to future hurricanes and other disasters? And if so, will the policing of disasters gradually become a routine feature in a nation that previously relied on civil society institutions to manage such threats?

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