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- Hurricane Katrina
- REFERENCES AND SUGGESTED READINGS

“Katrina” was initially the code-name given to a powerful hurricane that gathered force out in the Atlantic in the summer of 2005, moved across the southern tip of Florida, and then landed with a vengeance on the US Gulf Coast. The reason “Katrina” has become a prominent name in modern history and has earned a place in this encyclopedia, however, has to do with its aftereffects. Hurricanes are measured by the velocity of their winds, the height of their storm surges, and other similar properties. But disasters are measured by their impact on the human environment, and on that scale Katrina will be remembered as the most destructive disaster in the American experience.

In terms of lives claimed, Katrina may not have been the most lethal disaster. That grim honor still belongs to Galveston, Texas, where in 1900 a fierce hurricane killed 6,000 people as it swept across the island of Galveston itself and another 2,000 as it made its way inland. But when measured by the pain it inflicted on the persons caught in its path, the volume of damage it did to both human and natural landscapes, and the amount of money that will be necessary to restore even a semblance of the human habitat it damaged, Katrina is likely to reign for a long time as the most terrible disaster to have visited American shores as a result of a natural force. In the long term, moreover, we may one day conclude that the death toll from Katrina is far higher than the 1,720 individuals we now count as casualties of the storm, since the roster of persons from the affected region who have deliberately taken their own lives or who have succumbed from disturbances that can be reasonably traced to Katrina grows larger with the passing of each day.
The Hurricane

The storm itself - in many ways a prelude to the real history of Katrina - churned out of the Atlantic Ocean in the summer of 2005, the most active hurricane season ever recorded. By the third week of August, an unusual number of tropical storms and other events had been reported, so it was no cause for alarm when on August 23 the National Weather Service began to trace a tropical depression that was then forming off the coast of the Bahamas. Within 24 hours, however, the depression had been upgraded to a tropical storm and was subsequently given a name. Katrina was the eleventh storm of the season to earn a name (a fact one can learn from noting that “Katrina” begins with the eleventh letter in the alphabet). Katrina was upgraded yet again, this time to the rank of hurricane, just before making its first landfall in Florida on August 25. Katrina passed across the southern tip of Florida in about six hours, slowing considerably from its first collision with dry land, but even so it was responsible for eleven deaths, a billion dollars worth of damage, power outages in more than a million homes, and pockets of severe flooding.

Katrina weakened momentarily as it passed over Florida, but once it returned to the warm waters of the Gulf on August 26, it rapidly intensified to a Category 2 hurricane and began to move west. It continued to gain momentum and size throughout the day of August 27, growing into a Category 3 hurricane, and it dumped heavy rains over parts of western Cuba as it drove toward the Gulf Coast.

By August 28, Katrina had reached the zenith of its power and was declared to be a Category 5 hurricane, the highest grade that meteorologists can award. Its rotating winds extended 200 miles from the eye of the storm, meaning that it essentially filled the entire Gulf.

In the morning of Monday, August 29, Katrina had lost some of that force, but it came ashore at 6:10 a.m. with ferocious winds of 115 miles per hour, gusting as high as 130 miles per hour. The storm dropped 10 to 12 inches of water over southern Louisiana and Mississippi, and its circling winds generated 20 tornadoes in the space of a single day. Storm surges as high as 34 feet were recorded in Mississippi, and they did not dissipate until they had driven between 6 and 16 miles inland. In Alabama, 10 to 15 feet of storm surge simply submerged coastal areas and were responsible for flooding miles from the shore. Storm surges reaching the Louisiana parishes of Plaquemines, Orleans, and St. Bernard ranged from 12 to 22 feet. While all of this was going on, as the world was soon to discover, the combination of storm surges, massive waves, and powerful winds was beginning to erode the flood protection system that was meant to safeguard New Orleans.

Within a day of Katrina’s landfall, so many levees and floodwalls were either breached or overtopped that 80 percent of New Orleans was inundated. The flooding left dark and dangerous lakes of standing water up to 20 feet deep. It was 43 days before those floodwaters receded.

Warnings, Evacuations, Response
The National Weather Service began to monitor the tropical depression that was soon to become Hurricane Katrina on Tuesday August 23. Over the next seven days, the National Hurricane Center (NHC) issued scores of public advisories on the volume and the trajectory of the storm.

As Katrina moved toward its first target, southern Florida, on August 25, the NHC issued a hurricane warning for the entire region. Florida, Georgia, and Alabama activated their emergency response plans and began preparations for evacuation and shelter. The Federal Emergency Management Agency (FEMA), veterans of hurricane activities in the region, delivered ice, water, and food to various staging areas in states throughout the Gulf Coast.

On August 26, the NHC released for the first time a projection that Katrina would not only make a second landfall just east of the city of New Orleans, but would do so on the morning of the 29th. As the hurricane intensified, state officials in Louisiana and Mississippi began to prepare with greater urgency, recognizing that this massive storm could easily be "the big one" that scientists had been predicting and warning about for a number of years. Governor Kathleen Blanco of Louisiana and Governor Haley Barbour of Mississippi both declared states of emergency, and state agencies began setting their emergency response plans into motion and mobilizing disaster response personnel.

On August 27, Katrina was still heading directly toward New Orleans. The NHC issued several hurricane watches and warnings. Max Mayfield, Director of the NHC, called Governor Blanco and Governor Barbour personally, something he had done only once before in his 33-year career. President Bush took the highly unusual step of issuing federal emergency declarations for Louisiana, Mississippi, and Alabama prior to the arrival of the storm, which allowed the federal government to deploy predisaster assistance to the endangered region. In response to all those warnings and alarms and preparations, a number of localities in the Gulf area began to issue voluntary and even mandatory evacuation orders. Louisiana and Mississippi implemented longstanding counter-flow plans - to open up incoming highway lanes to outgoing vehicle traffic - in order to make it easier for residents to evacuate. The threat of Katrina also resulted in the opening of shelters throughout the region in anticipation of the mass exodus of residents.

On the morning of August 28, the National Weather Service issued an urgent (and, as it turned out, prophetic) bulletin, bristling with warnings:

Devastating damage expected ... A most powerful hurricane with unprecedented strength ...

Most of the area will be uninhabitable for weeks ... perhaps longer.

The majority of industrial buildings will become non-functional ... All wood-framed low-rising apartment buildings will be destroyed ... High-rise office and apartment buildings will sway dangerously - a few to the point of total collapse. All windows will blow out.
Airborne debris will be widespread - and may include heavy items such as household appliances and even light vehicles … Persons, pets, and livestock exposed to the winds will face certain death if struck.

Power outages will last for weeks. Water shortages will make human suffering incredible by modern standards.

As the warnings became more frequent and more desperate, New Orleans issued its first-ever mandatory evacuation order. It was broadcast 20 hours before Katrina came ashore, and 25 hours before the levees began to fail.

Most residents heeded the warnings issued by various government agencies, and an estimated 1.5 million fled their homes in the days and hours preceding landfall. Some transportation experts described this as “the most successful highway-based evacuation in US history” (Wolshon et al. 2006: 1). Yet, of the more than 460,000 of New Orleans proper, somewhere between 100,000 and 120,000 were unable or unwilling to evacuate. Some remained in the danger zone because their jobs required them to do so. Tens of thousands of low-income persons lacked reliable transportation or the cash necessary to pay for gas or food or lodging away from home. Many others had responsibilities for aged or disabled kin, as is usually the case in poorer neighborhoods. Evacuation is a wholly different prospect for persons who have no credit cards, no real experience of the road, no familiarity with the places to which they will be traveling, no networks of family or friends outside the danger zone on which they can draw, and large households full of the young, the old, and the otherwise dependent. Many of the persons who stayed behind, then, had little choice in the matter. But quite a number of others, it should be added, remained behind because they reasoned that they would be able to ride out the storm in their own homes. They were roundly criticized and ridiculed for that decision, but it is worth noting that they were in fact quite correct in those calculations. None of the advisories had ever asked them to evacuate the city on the ground that the levees were about to collapse. They had been warned to be wary of storm surges, wind bursts, and rain falls, as the examples above indicated; and they were right to think that they could have coped with those emergencies. They were struck low by events that the most dire of warnings had scarcely mentioned.

As tens of thousands of residents streamed out of New Orleans on August 28, city officials opened the doors of the Louisiana Superdome - an immense, enclosed sports arena - to provide a “refuge of last resort” for people who remained. Some 10,000 had been moved to the Superdome the day before Katrina made landfall on the 29th, and in the hours to follow, as the levees began to collapse and the city began to fill with water, thousands more made their way there. The New Orleans Convention Center, which was never intended to serve as a shelter, was opened out of sheer necessity, and in those dark hours the flooding drove thousands of others to attics and rooftops and other islands of high ground to await rescue. Some of those stranded survivors who were rescued by boat or helicopter were transported to the Superdome or the Convention Center; others were deposited on highway overpasses or other available dry patches and told that relief would soon be on its way. For many, as the world would soon know from television coverage,
relief did not materialize for days, during which time desperate human beings were left with no shelter from the sun or heat, no food, no water, and - worst of all, in some ways - no tangible indication that the larger society had their interests at heart. Nor had that feeling disappeared in the months and years to follow.

The response to Katrina was severely hampered by the magnitude of the disaster itself: widespread flooding, crippling infrastructure damage, and vast communications problems resulting from downed power lines and cell phone towers. But those challenges were magnified many times over by what can only be described as astonishing failures of leadership at every level of government - all of which is well documented in a series of critical reports issued by the government itself (US Congress 2006; US Senate 2006; White House 2006). Officials from FEMA and from the US Department of Homeland Security in particular were singled out for their failure to respond in a responsible manner with life-sustaining assistance to tens of thousands of people - most of them low-income African Americans and virtually all of them citizens of the United States.

In the days following the appearance of Katrina, somewhere between 30,000 and 60,000 persons sought refuge in the Superdome, and as many as 25,000 ended up in the Convention Center. The fact that those estimates are so inexact speaks volumes about the confusion governing the situation. Neither facility was equipped to handle anything like the swarm of humanity it ended up hosting. The supply of food and water was grossly insufficient. Sanitary facilities were few and soon beyond use. There was no power at all, and thus no lights, no air conditioning, no public address system. Police officers were conspicuous by their absence, as were civic officials of any other kind, and for reasons both easy and hard to understand, there was little, if any, medical care. Conditions in the Superdome and Convention Center soon became critical. Governor Blanco appealed to FEMA for buses to help evacuate residents marooned in the city as early as the evening of August 29. None appeared at all until two days after the flooding began, and they did not arrive in sufficient number until three days afterwards. Thousands of survivors had to wait in those degrading conditions until Sunday evening, September 4, only a few hours short of a full week after Katrina hit the coast.

To further complicate matters, rumors soon began to be circulated that nameless horrors were taking place in the Convention Center and Superdome as well as on the streets of the city more generally. Those rumors were quickly broadcast to the nation by an over-eager press, and so became a matter of official truth. There were reports of murders in the hundreds, rapes and assaults of other kinds in the thousands, and acts of larceny in the hundreds of thousands. Most of those rumors, as it later turned out, had no basis in fact, but there appears to be no question that they contributed to the climate in which rescue operations were being contemplated. Only time will tell how many police officers were intimidated by what they heard about the human goings-on in the Superdome and the Convention Center, but it is obvious that persons who might have offered medical aid and other kinds of help were dissuaded from doing so.

The immense wave of evacuees generated by Katrina resulted in a tremendous need for shelter in both the short and the long term. Most evacuees found lodging in hotels or
motels or in the private residences of friends or family members, and their need for refuge was usually relatively short. As is the case for hurricanes everywhere, most evacuees learn to their relief that their homes were spared, and return home within a day or two to clean up and to resume their lives. But as many as 500,000 (here, too, reliable figures are hard to come by) sought long-term refuge in private homes or public shelters. The American Red Cross operated nearly 1,100 shelters in 27 states. Hundreds of other unofficial shelters were opened in schools, churches, and community facilities throughout the Gulf Coast region and the rest of the country. According to FEMA data, well over a million evacuees stayed, at least during the initial days after the storm, in nearby portions of Louisiana, Mississippi, Texas, and Alabama, and many of them either remained there for many months to come or are still there as of this writing. But many evacuees found themselves scattered across the nation and a long way from home.

Economic and Physical Impacts

Assessing the impacts of any disaster is an inexact science, and the magnitude of this one makes the task more difficult yet. Even so, one can assert with confidence that Katrina was the costliest disaster in the history of the United States, with economic losses ranging from $80 to $200 billion. Approximately 300,000 homes were destroyed entirely or made unlivable. More than 150,000 businesses were severely impacted. Katrina did untold harm to the communications and power infrastructure of the region: its winds knocked out more than 3 million phone lines, and 2.5 million families reported power outages in Louisiana, Mississippi, and Alabama.

Katrina will surely have other substantial, long-term effects on the economies of Mississippi and Louisiana, the two poorest states in the nation even prior to the disaster. The region visited by Katrina is at the center of the US national energy supply system, and hundreds of oil platforms, gas-producing wells, pipelines, and refineries were either damaged or destroyed by the storm. In addition, Katrina halted shipping operations in New Orleans, the world's fourth largest port: it was responsible for significant harm to the region's transportation system, sinking or grounding hundreds of barges, which serve as the basis for commercial shipping along the Mississippi River, and damaging 12 wharfs. Most other ports along the Gulf Coast were affected by the storm as well. Commercial and recreational fishing industries suffered hundreds of millions of dollars in lost revenues as a consequence of ecological damage done to fishing grounds or physical damage done to fishing facilities.

Katrina laid waste to some 90,000 square miles of land, a territory about the size of Great Britain, and it caused substantial physical and environmental damage - the full extent of which may not be known for decades. It leveled an estimated 320 million trees in Louisiana and Mississippi, scarring the landscape and damaging the natural habitats of a number of native wildlife species. For several reasons, coastal Louisiana was already losing land at an alarming rate before Katrina made its unwelcome appearance, and it has been estimated that an additional 217 square miles of vital marshland was transformed into open water by the storm. Katrina dramatically accelerated the erosion of protective barrier islands and wetlands across the coast, increasing the susceptibility of an already
infirm ecosystem to the effects of future disasters. New Orleans in particular is in a far more vulnerable position than it was before. In that sense, future storms coming over the horizon with the intent of doing harm to human settlement will owe a tremendous debt to Katrina as well as to all the human settlers who contributed to the fragility of the coastal wetlands.

To add to these barely calculable perils, it is to be noted that Katrina also created environmental and health hazards that will complicate life in the region even if they are never fully understood. The storm surge damaged 466 chemical facilities, 31 hazardous waste sites, and 16 Superfund toxic waste sites. It either destroyed or compromised 170 drinking water facilities and dozens of wastewater treatment plants. It was responsible for 142 separate oil spills, releasing 8 million gallons of oil into coastal waterways. These are simply numbers, of course, not calculations of damage done, because we will not know for decades what harm is likely to come from this potential contamination. The same applies to the flooded portions of New Orleans, where it remains to be seen whether the polluted floodwaters or the growth of noxious black mold they left behind pose any problems of toxic exposure.

The Human Toll

It is very important to appreciate that for many (and perhaps most) of the persons who survived it, Katrina is not a thing of the past. Disasters do not come to an end just because floodwaters abate or storms subside or fires go out or the quakings of the earth cease. So long as the effects of the disaster continue to do harm, it is for the survivors a continuing storm, and any audit of its human costs have to take this into account.

The official number of fatalities directly attributed to Katrina is 1,720, of which 1,464 took place in Louisiana, 238 in Mississippi, 14 in Florida, 2 in Georgia, and 2 in Alabama. As one might assume from Louisiana's high toll, a considerable percentage of those deaths, nearly 80 percent, took place in the New Orleans metropolitan area. Drowning was far and away the most common cause of death there, although the actual number of persons who perished in that way will never be known exactly because retrieval of bodies from that waterlogged city was so delayed that cause of death could not easily be determined. As we noted earlier, those tolls do not tell us much about the actual human costs of Katrina because it is widely understood in the impacted communities that subsequent deaths from drug overdose, other forms of substance abuse, suicide, mental and physical illness, and similar "indirect" deaths can be attributed to the storm even though they occurred after it was officially declared over. In partial recognition of that, the Louisiana Department of Health and Hospitals recorded an additional 480 deaths of Louisiana residents who died out of state in the months following their evacuation from the disaster zone.

Age was the single most important factor determining who died as a result of the storm. While the elderly (here meaning those aged 65 or older) made up only 15 percent of the pre-storm population, they represented over 70 percent of the fatalities in Louisiana. Men
died at higher rates than women, and African Americans, other things equal, died in numbers that exceeded their proportion of the overall population (Sharkey 2007).

The number of individuals who suffered from injuries or physical illnesses as a consequence of the disaster is almost impossible to estimate because we have almost no reliable data on those who evacuated before the storm or withdrew from the area in the days and weeks following. One month after the hurricane, the Centers for Disease Control and Prevention reported no outbreaks of disease, as had been widely feared by public health officials, but in the time since considerable numbers of persons have been treated for respiratory problems like shortness of breath and asthma, rashes, and other ailments that are generally associated with periods of severe stress. To make matters worse, many evacuees lacked access to medical assistance or to vital medications, adding substantially to the odds that they would become victims of other diseases and disturbances. We do not have space to go into the matter now, but this audit should also deal with problems caused by circumstances of the evacuation itself. Among them are high levels of stress and the profoundly ironic fact that many of the FEMA-issued trailers brought in to help evacuees only exposed them to levels of formaldehyde that were likely responsible for ear, nose, and throat irritations as well as nausea and severe headaches.

The human trauma inflicted by Katrina was severe and is likely to be enduring. Surveys conducted in the wake of Katrina have confirmed what health officials already knew - that both child and adult survivors have suffered from high rates of depression, anxiety, and post-traumatic stress disorder (Abramson & Garfield 2006; Galea et al. 2007). The extraordinary array of stressors that survivors were exposed to (life threats, bereavement, long-term displacement, loss of familiar community surrounds, loss of home and hearth, separation from kinfolk and important others) all contribute to elevated rates of mental illness. In recognition of this ongoing crisis, the American Red Cross continued to offer mental health assistance to survivors well into the second year following the catastrophe. The Red Cross reportedly had over 1.6 million mental health contacts in that time.

Almost three years after Katrina generated one of the largest mass movements of population the United States has ever seen, hundreds of thousands of Gulf Coast residents had not yet returned home. Nor did it seem likely that they would be able to do so for a long time, if ever. Although reliable estimates are difficult to obtain, the record suggests that low-income African Americans have the least chance of returning even though they may well be the residents most likely to suffer from such a displacement. Their prospects are dim. The city to which they hope to return lacks low-cost housing options (and is in the process of tearing down what low-cost options survived the storm). It lacks employment opportunities and public services. And most painful of all, perhaps, the city - their city, after all - is behaving in such a way as to give the impression that it does not want them to return at all.

Finally, Katrina dealt a devastating blow to a region - and to an important urban center - that was already afflicted with more than its share of poverty, racism, and gender inequality. The storm had the effect of peeling away the surface of that already afflicted body and revealing its inner workings to a scrutiny that will also have to be a part of the
process of restoration. Katrina exposed a number of obvious problems concerning the country's ability to deal with emergencies on this scale. But it also exposed the ways in which the country has dealt with and continues to deal with economic as well as social inequality.

SEE ALSO: Class; Diaspora; Disasters; Ecological Problems; Race; Stratification and Inequality, Theories of; Stratification, Race/Ethnicity and


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