

# Hurricane sandy case study

Business



However, poor land use management and the lack of former amalgamation practices, that cannot soon be undone, have placed many people and significant amounts of property and other structures in harm's way increasing not only human vulnerability, but that of the environment as well. Another caveat to this unique storm was the fact that, given its immense size, it would affect multiple regions at once creating an important need for inter-agency coordination and communication.

The vast majority of failures in the management and response to emergency events, such as super storms Like Hurricane Sandy, has been attributed to lack of communication and coordination among personnel charged with emergency management across all levels of government – federal, state, local and tribal.

The failure of these emergency management entities to establish mutual aid agreements and positive working partnerships in advance of emergency incidents only adds to the chaos and slows response and recovery efforts during and in the aftermath of crises events.

The research conducted regarding emergency management preparation and response to Hurricane Sandy Indicates that Inter-agency coordination and communication was a strong point In this case. However, the limitlessness were already present in these coastal regions due to poor land use practices and building code policies. Although these vulnerabilities had previously been identified little had been done to address these issues.

It is important to the field of inter-agency disaster management to study the successes affiliated with Hurricane Sandy so that emergency managers can model this response for future emergency or disaster events.

Studying what can be done to improve preparation and mitigation measures, the causes and uniqueness of the storm itself, and the response and recovery protocols of Hurricane Sandy can be extremely valuable in establishing more effective practices for future events and can lead to better mitigation practices overall.

The Event Hurricane sandy will long be remembered as one of the Atlantic ocean's largest and most devastating storms to make landfall in the United States. Although this hybrid super-storm is believed to be responsible for killing 70 people in the Caribbean, 109 people in the United States and causing an estimated \$50 billion in damages in the United States alone, its affects could have been far worse if not for the exceptional lead time and accurate forecasting of this hurricane.

The storm was first detected in the Caribbean on October 21, 2012 and was predicted to affect the Eastern Seaboard of the United States within a week. On October 22nd the tropical depression off the coast of Nicaragua gained strength and was upgraded to Tropical Storm Sandy. By October 24th the storm had begun to move north across the Caribbean and crossed Jamaica as a category one hurricane with sustained winds of 80 MPH.

Hurricane Sandy unloaded more than 20 inches of rain over the Dominican Republic and Haiti where it is estimated to have killed 50 Haitians due to flooding and mudslides.

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Dryer, 2012) By October 26th, Hurricane Sandy had sustained winds of 110 MPH and is nearly a category three storm as it made landfall in the historic city of Santiago De Cuba and destroyed nearly everything in its path. By October 27th, Hurricane Sandy had moved away from the Bahamas and was on track for the coast of Florida, leaving in its wake an estimated death toll in the Caribbean of 70 people and approximately \$300 million dollars in property damage to the Caribbean region. After crossing the Bahamas, Hurricane Sandy turned slightly northwest and began heading for the coast of Florida.

Forecasters continued working to narrow down the region where they believed Hurricane Sandy would likely make landfall and cause the most damage. Emergency managers in the United States were tracking the progress of the storm and gearing up for its expected arrival with massive preparation efforts that will be presented later in this paper.

By October 28th, Hurricane Sandy had begun paralleling the coast of the Carolina's and continued moving northwest keeping its eye well offshore.

Forecasters began to detect an unusual weather configuration and predicted that it was inevitable that Hurricane Sandy would marry up with other theater patterns, namely a high-pressure cold front to the north. As predicted, Hurricane Sandy morphed with the high-pressure cold front and became a powerful super storm with winds covering over 1, 000 miles. The super storm gained strength and intensity producing a record 13-foot storm surge that was also intensified by the fact that tides were already high due

too full moon. The storm surge was expected to cause flooding conditions that were the worst case scenario for the region.

On October 29th Hurricane Sandy turned its focus toward the northwest and began its 300-mile trek to the shores of Atlantic City, New Jersey.

The 300-mile run to the coast gave plenty of time for Hurricane Sandy to combine with other weather systems off shore to gain energy and build up a significant storm surge that would guarantee a powerful and sustained punch to the New Jersey shores. Given the phenomenal size of the super storm, Hurricane Sandy was already delivering high winds and dumping heavy rains in Washington, D. C. Maryland and Delaware causing wind damage to structures, downing trees and power lines, and cutting off power to millions of people. By the time all was said and done, Hurricane Sandy had affected “ more than 0 million people on the Eastern Seaboard.

” (Dryer, 2012) Rainfall totals across this region in the short amount of time that it took Hurricane sandy to Doll tongue totaled runner Trot 2-lenses Turner Inland Ana 10-inches in regions closer to the coast, holding true to what forecasters had predicted earlier in the week. Sameness, 2012) By 8: pm on October 29th Hurricane Sandy, now classified as a post-tropical northeaster, made its promised landfall near Atlantic City, New Jersey during a full moon high tide. Due to the fact that the storm had taken an unusual track and approached the coast from the southeast meant that he strong cyclonic winds and highest portion of the storm surge was to the front of the weather system as it pushed ashore. These conditions meant that the winds

and storm surge, combined with the storm's forward motion, brought with it the worse case scenario for the harbors of New Jersey and New York.

The record high storm surge, enhanced by the full moon high tide, easily topped the seawall in Lower Manhattan, New York causing flooding to portions of the subway system and to the commuter tunnel that connected Lower Manhattan with Brooklyn, New York.

The 1,000 mile circumference of the storm continued to wreak havoc throughout New Jersey and New York overnight through three cycles of high and low tides. Thus, flooding and wind damage continued relentlessly throughout many coastal and even inland towns.

By daybreak on October 30th the super storm had begun moving away from New York, but the backside of the huge storm was still inflicting its last hurrah before weakening and moving further inland toward Pennsylvania. On October 31st Hurricane Sandy dissipated over the western region of Pennsylvania leaving in its devastating wake 109 people in the United States dead, property damage exceeding \$50 billion, and an opportunity for lessons to be learned to improve mitigation measures and emergency management practices before the next disaster event strikes.

**Preparation & Mitigation** The early detection of the tropical depression off the coast of Nicaragua in the Caribbean on October 21st allowed for significant lead time for preparing the regions expected to be in the storm's path well in advance of it making landfall. Teams of weather forecasters and emergency managers in the United States had been tracking the storm since its birth

deep in the Caribbean in order to predict its damage potential and possible track to make landfall on the United States' Eastern Seaboard.

In order to mitigate the potential damage and effects of the storm, city officials, mayors and state governors began formulating emergency response plans for their respective cities. For example, New York Governor Andrew Cuomo “ ordered the Metropolitan Transportation Authority to start planning for an orderly suspension of service” in anticipation of the impending storm. New York City officials also ordered the evacuation of areas in what they identified as Zone A of the city, which is an area prone to flooding, and public schools were ordered closed. (Unfunny. Com, 2012) Mayor Bloomberg and New York City officials comprised and released a plan to meet the challenges faced by New York's “ growing population, aging infrastructure, a changing climate, and an evolving economy.

“ The city plan's goals were essentially to “ build a greener, greater New York” With a projected completion by the year 2030. (Pliancy, 2011) The city plan was updated in 2011 to include initiatives to improve the physical structures of New York and the functionality of its infrastructure for a more sustainable city.

A thorough review of this city plan resulted in some conflicting interpretations of what seemed to be the identification of vulnerabilities, such as the rising sea levels, Walt Disney World's plans to build a new coastal waterfronts identifying this coastal vulnerability, the plan acknowledges that the city's 520 miles of coastline present an increased risk of flooding as sea levels continue to rise an anticipated ten inches over the

next twenty years and as storms become more severe due to global warming and climate change.

Conversely; however, the plan presents actions aimed at creating more affordable homes and neighborhoods to handle the emend of an ever-increasing population. One such action is presented in a case study in which the city is developing a waterfront area named Hunter's Point South located in Queens, New York that overlooks midtown Manhattan.

The 2011 updated pliancy proposed that, “ By 2013, the first phase of Hunter's Point South will have transformed more than 800, 000 square feet of vacant waterfront land into an active neighborhood with vibrant retail corridors. ” (p. 5) The development of waterfront lands such as this only serves to place a greater number of people and structures in harm's way. It is inevitable that rising sea levels and future super storms will adversely affect the residents of the Hunter's Point South community both in property damage and lives lost. An action plan that would have been more succinct with mitigating the vulnerability of rising sea levels and flooding would have been a proposal to transform vacant coastal waterfronts, such as that mentioned above, into natural barriers like wildlife sanctuaries, estuaries, or public parks.

The pliancy's sustainability definition is grandiose, but lacks plans that would help to build a more sustainable natural environment.

Instead, the definition of sustainability focuses on growing areas of the city accessible to transit, employment opportunities, a better selection of housing choices, water and energy conservation, and using materials and methods to

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improve public health. Albeit these ideas may be noble, they do not present solutions on improving environmental sustainability, which is key to increasing human sustainability.

Although some great ideas have been presented in both the updated 2011 plan and other commissioned reports regarding rising sea levels and increasingly powerful storms, New York appears to have been hindered by the costs of doing something to protect against these inevitable elements. Matt Sledge, author of an article that appeared in the March 30, 2013 edition of the New York Huffington Post suggested that mitigating for the current structure of New York against the environmental hazards will cost billions.

This is a price tag that seems to make officials, who are more concerned about the state of the economy, shy away from spending money on “ soft edge” protections such as sand dunes, marsh islands, oyster beds, artificial islands and a system of reefs that could all absorb significant amounts of water caused by storm surges. Preliminary studies indicate that solutions such as the “ soft edges” mentioned above are the best, yet most costly solutions to mitigation.

However, these studies are incomplete as they are not funded sufficiently by officials.

Some work is being done to implement “ soft edge” solutions, but much more support and money is needed to make the solutions fully effective. Sledge (2013) identified the following proposals to protect against the next big storm: Building large storm surge barriers such as that which the Dutch have built, but cautions that people would be enticed to into feeling

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protected by the rooters and would build behind it, thus increasing their vulnerability should the barrier fail. Limit development on the waterfronts.

The best way to protect against property damage Ana lives lost Is to not Dull tender In ten TLS place.

Seriously Invest in the “ soft edges” barriers, which appear to be the best solution for the environment, people, and property. Building sea walls, which is significantly cheaper than other “ soft edge” approaches, but provide no assurances that they would be effective, given the evidence revealed by Hurricane Sandy’s ability to easily top the sea wall into Lower Manhattan.

Investing in beach fill projects to elevate sand dunes to help protect against waves and wind, although more money needs to be spent in studies for its feasibility and effectiveness for providing permanent protection. Hardening New Work’s electrical grid by relocating crucial equipment above floodplains and installing submersible switches to withstand flooding conditions.

Sealing off subways by raising ventilation grates and installing inflatable devices to stop water from entering the underground subway system tunnels. In researching information available through a variety of media and online sources, it appeared as Hough those charged with emergency management responsibilities were taking Hurricane Sandy seriously from the point of its detection in the Caribbean and working to prepare their respective regions for the storm’s damaging winds, rains, and flooding potential.

Emergency managers from all levels of government were monitoring Hurricane Sandy's progress, including President Obama who was briefed daily in meetings with key officials such as the Director of Homeland Security, the FEMA Administrator, the National Hurricane Center Director, and the Homeland Security Advisor. These officials were given direction by President Obama to reach out to all the state governors in the path of Hurricane Sandy to ensure that they had all the necessary resources and support needed to prepare for and respond to the arrival of the super storm.

On Saturday, October 27th FEMA activated the National Response Coordination Center (NRC) at its headquarters in Washington, D.

C. The NRC is comprised of multiple agencies and is responsible for coordinating the federal response with assisting state agencies in their preparation for and response to emergency situations. The NRC essentially serves as a support organization to state agencies. On Sunday, October 28th President Obama made federal support available to save lives, protect public health, protect public safety, and to protect property by signing emergency declarations for the states of Maryland, Washington, D.

C. , Connecticut, Massachusetts, New Jersey, and New York.

“ These declarations allow FEMA to provide resources directly to state, tribal, and local government engaged in life-saving and sustaining activities. ”

(FEMA, 2012) The day before Hurricane Sandy's arrival, there were already over 1, 000 FEMA personnel on the ground on the East Coast assisting in response operations, inter-agency immunization support, and logistical

support. Federal support was available both in advance of the storm and in its aftermath.

Details of federal support made available in the story's aftermath will be presented later in this paper. At the state level preparations were also well underway in advance of the storm, as I indicated earlier in this section. Officials could only prepare citizens and attempt to harden vulnerable areas with temporary measures, as there certainly wasn't enough time to remedy all of the past practices that created these vulnerabilities to begin with. New

York Mayor Michael Bloomberg held press conferences to provide information and to encourage New Yorkers not to become complacent and to take the advise of officials seriously given ten dangerous potential AT Hurricane sandy. New York Salty McCall took the following measures in preparation for Hurricane Sandy's arrival (Katz, 2012): Suspension of public transit service with the Metropolitan Transportation Authority (MAT) Relocating MAT buses and trains to safe locations to protect them from damage New York Broadway theater owners cancelled performances/shows on Sunday and Monday evenings when the storm was anticipated to be at its worse

Cancellation of events in city parks and the closure of city parks and beaches  
Cancellation of elective surgeries and the discharge of patients from hospitals and care facilities located in Zone A, which was an area most vulnerable to flooding Ensuring back-up generators were operable at critical care facilities in the event of power outages The New York Downtown Hospital located in Lower Manhattan was evacuated Sunday evening in

anticipation of power outages and flooding in the area Major airline carriers cancelled flights in and out of the area in anticipation of the storm Cleaning storm drains and reinforcing structures and areas vulnerable to flooding and wind damage Opening, staffing and supplying 65 shelters in various locations throughout the city to provide shelter to families and pets affected by the storm New York Stock Exchange closed their doors on October 29th in anticipation of the storm's arrival, but continued on-line trading Providing transportation services to evacuate those in need through requests on the 311 phone system and the city's Office of Emergency Management website Suspension of ferry service on the East River

Police and highway patrol officers were placed on extended work hours and propositioned to assist stranded motorists and others in need Special rescue units with the fire department were activated and placed in the most vulnerable areas The New York Air and Army National Guard were instructed by New York Governor Andrew Cuomo to be prepared to mobilize in response to the storm Assessment of construction sites were conducted and cranes and other heavy equipment was tied down and secured Residents were encouraged to prepare “ go bags,” secure outside property, stock supplies for water and other survival essentials, use stairs instead of elevator, and cover windows with drapes or other materials in the event of glass breakage or projected objects from other buildings New York wasn't the only city; however, bracing for Hurricane Sandy impact.

The Governor of New Jersey, Chris Christie, ordered that residents evacuate the barrier islands in the region and closed all state offices on the day the storm was predicted to make landfall. Governor Deanne Mallory of <https://assignbuster.com/hurricane-sandy-case-study/>

Connecticut ordered residents to evacuate in parts of the region that were expected to receive the heaviest impact from Hurricane Sandy. The preparation measures mentioned above were the best actions that could have been taken at the time given the fact that known vulnerabilities were not addressed or corrected through improved mitigation before the impending super storm.

**Response & Recovery** As mentioned earlier when discussing preparation of Hurricane Sandy, emergency managers and other officials, up to the level of the United States President, were taking the threat of this super storm seriously. Preparation measures instituted by the federal, state, and local governments made the transition to response and recovery activities more seamless and rapid.

By Sunday, October 30th President Obama already cleared New York, New Jersey and Connecticut as major starters, thus making federal funds available for victims to apply for aid. In addition, President Obama directed FEMA to establish a power restoration task force to return power and fuel resources as quickly as possible in the areas affected heaviest by the storm.

By October 31, 2012, there were 2, 276 FEMA personnel deployed and on the ground working on the East Coast.

New York Amsterdam News staff writer, Stephen Johnson, wrote an article in the November 29 – December 5, 2012, edition regarding FEMA criticism. Despite FEMA's rapid response the organization still received criticism from victims and dealt with claims that private ND volunteer organizations were

outperforming them in response and recovery efforts. FEM. representative Victor Engine addressed these complaints by explaining that the role of FEM.

“ is to assess damage and direct victims to the best possible government service to address their needs. ” (p. ) Fame’s performance in the response and recovery efforts following Hurricane Sandy have been redeeming given the black eye that the federal government sustained as a result of their poor performance with the 2005 super storm, Hurricane Strain, that devastated New Orleans. The government’s response to Hurricane Sandy demonstrate its ability to learn from past mistakes. Regions affected by Hurricane Sandy had already established inter-agency partnerships in advance of the storm by establishing command and control of the incident utilizing the protocols in accordance with the National Response Framework (NOR) and the National Incident Management System (AIMS).

New York City Mayor Bloomberg commended FEM. and Homeland Security through the federal government for being there when they were needed and for delivering supplies and resources immediately. The overall response and recovery efforts for the regions affected by Hurricane Sandy were quite seamless. Officials irked together and communicated effectively to respond to the needs of those affected in their respective Jurisdictions. Coordination among federal, state, municipal, and nonprofit organizations was achieved effectively bringing all necessary resources to areas in need.

Preparedness measures I acted well in advance of the storm undoubtedly saved life’s.

For example, the mandatory evacuation of Zone A in New York was an effective call that removed people from harm's way. Given the inevitable sea level rise over the next two decades, there are some lessons that can be learned even from a successful evacuation call such as this. In the aftermath of Hurricane Sandy, it was discovered that the storm surge actually extended beyond Zone A into some surrounding neighborhoods that were not evacuated. As Mayor Bloomberg stated in response to this during a press conference at the New YorkMarriottDowntown on December 2, 2012, " So now, we've got to reexamine the evacuation zones and update them to reflect the new reality that we face.

(Bloomberg, 2012) Rapid Repair Teams of more than 1,600 skilled workers to fix wiring, plumbing systems, and other home systems were deployed to assist with getting those displaced from their homes back up and running as quickly as possible. There were over 10,000 people who took advantage of this recovery service in which FEMA foot the repair bills. Recovery efforts continue today in the areas affected most severely by Hurricane Sandy. Officials must now shoulder the responsibility of enacting new practices, policies and protocols based on the lessons learned from this super storm, as tender wall De Torture events Tanat are Kelly to continue producing more severe conditions.

Conclusions and Recommendations Conclusions After reviewing the resources and information regarding Hurricane Sandy, it is clear that officials and emergency management applied lessons learned from Hurricane Strain regarding the preparation, response and recovery operations at the federal, state and local levels. The DISH and FEMA certainly demonstrated that they

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revamped their protocols since the black eye the federal government suffered following Hurricane Strain. Preparation measures at all levels of government ensued immediately upon detecting the tropical depression deep in the Caribbean that would soon become super storm Hurricane Sandy. I believe that the preparation measures taken by officials and emergency managers went as well as they could have given that they had to work with the vulnerabilities already present.

Mitigation efforts leave much to be desired and recommendations will be made later in this paper to address those concerns. Preparation, response and recovery efforts were efficient and effective due to the fact that officials took this storm seriously from its inception. Regions expected to be impacted by the super storm were evacuated and property was boarded up and secured with temporary reinforcements well in advance of the storm. These preparation measure undoubtedly saved lives and helped to reduce some property damage costs, although those costs were very high in the end. Communication and coordination was established early among all levels of government, including other officials and volunteer, non-profit and private sector organizations.

This can be attributed with a rather seamless transition from the preparation phase through response and recovery efforts overall.

Recommendations The updated 2011 pliancy city plan for New York introduced hundreds of initiatives to help create what was termed a greener, greater New York. This plan included some great proposals and many of the initiatives were already enacted, but far from being complete. A significant

sticking point with this plan for e was the manner in which the term sustainability was defined. The definition appeared grandiose and sounded more like a political platform to encourage more people to want to live, work, play and spend money in New York.

The definition of sustainability never addressed protecting the natural environment. Instead, it proposed providing more housing choices to accommodate various income levels and cultivating multi-use neighborhoods with access to public transit.

Perhaps one of the most glaring problems with this plan was the case study presented for the Hunter's South Point neighborhood. As mentioned earlier in this paper, the development of his once vacant coastal waterfront area has only served to place more people and property in harm's way. As of 2013, it is proposed that there will be more than 800, 000 square feet of vulnerable waterfront transformed into an active neighborhood of housing, shops and restaurants.

Although the plan addresses the fact that sea levels are expected to rise ten inches over the next two decades creating greater vulnerability along shorelines and more significant storm surges, this information seems to be largely ignored given the city's plans to continue with housing development along these critical coastlines. It is recommended that instead of placing more people and property in harm's way, that perhaps we instead invest in amalgamation practices that target along our coasts. In the long run, those residing in cities with vulnerabilities such as New York, would be better served by their cities investing in projects that provide natural barriers

to what is inevitably a future of greater super storms and other catastrophic events influenced by climate change and caused by the ecological footprint humans continue to leave on the environment in which we live.