THE STORM RESOURCE

Hurricane Ike Vital Records Case Study

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HURRICANE IKE IMPACT REPORT

VITAL RECORDS CASE STUDY - Efficient Recovery Requires Accessible, Accurate Information

Storm History

1900 – Galveston Hurricane

1961 – Hurricane Carla

1983 – Hurricane Alicia

2008 – Hurricane Ike

Galveston, Texas is an island community on the Gulf Coast, just fifty miles from Houston. Once known as "the Wall Street of the South," Galveston was formerly a major center for finance before the 1900 Hurricane destroyed the business district and Galveston's first major industry. Today the barrier island's economy is primarily derived from the University of Texas Medical Branch, which in 2008 employed 12,500 people and supported 7,000 other jobs, and tourism. On a typical Memorial Day, as many as a quarter million vacationers will crowd the beaches of the town where the local population is currently estimated at only 46,000.

Case Facts

With Hurricane Ike in September of 2008 came a mandatory evacuation to residents of some parts Galveston Island. The hurricane itself seemed dire, but it was what came after the mammoth storm that was truly terrible. There was no electricity, fuel or running water. Sewage, sludge and garbage covered the streets and were a major source of concern for public health. Communication to and from the island was also extremely limited. First responders would be necessary in making Galveston habitable for those who had left and for recovering those who had remained for the storm.

A sixty-five vehicle convoy of Texas Task Force One responders would meet part of that need. Their primary mission was to repair as much of the infrastructure as they could, including broken water and sewage lines. Communication would play a vital role in operations of the twelve-hundred responders, but a key element was

missing. There were no up-to-date electronic maps of the city's utilities. In fact, it took half a day to track down the only copy of the only existing maps of Galveston's water system.

Key Decisions

Joanna Sanchez used GIS mapping and an online map of Galveston's streets to develop an layered, digital map of Galveston's water lines to aid responders in locating and repairing leaks .

The lack of adequate maps would define Joanna Sanchez's part in aiding Galveston's recovery. She was selected to accompany the Task Force One convoy to Galveston based on her experience using GIS in the aftermath of Hurricane Dolly to make maps of topographical data, which allowed crews to see elevations and better place water pumps to restore water supply following the storm. However, Sanchez would play a slightly different role in recovering from Hurricane Ike.

Drawing on her experience with mapping, Sanchez concluded that a single copy of outdated maps would be totally insufficient. However, none of FEMA's or Task Force One's copiers were large enough to accommodate the 24X36 inch maps, and she was only allowed to keep the original maps for one night to reproduce them. In fourteen hours, Sanchez used GIS software and an online map of Galveston's streets to develop a layered, digital map of Galveston's water lines in five zones that could be duplicated as often as necessary. Teams of responders now had the information they needed to begin shutting valves and sealing leaks in water lines.

Sanchez's next priority was the sewage system. The sewage system seemed completely out of commission, and filth was backing up into homes, businesses and the streets. Lift stations pump sewage from lower level pipes into pipes that are elevated enough to access treatment facilities. When lift stations malfunction, sewage backs up in the pipes and can result in these major sanitation and public health issues. Sanchez digitized and mass produced maps detailing the locations of sewage lift stations, allowing teams to visit and analyze the status of each one. Ultimately the responders were able to address the waterlines and the sewage lift stations; however, it was only after they had lost three

work days to collecting necessary data.

Shortly thereafter, the Army Corps of Engineers arrived and wanted this same maps and information, but in latitude and longitude. This data needed to be standardized and accessible to all first responders. Sanchez used the Global Positioning System (GPS) and GIS to map the exact locations of Galveston's utilities that would be usable for groups beyond Texas Task Force One.

Task Force One repaired 70 traffic signals, 207 water leaks and cleared street signs and trash containers

Conclusions

The Task Force One team repaired seventy traffic signals, 207 water leaks, and cleared countless street signs and residential trash containers. In addition to that, Sanchez developed a thorough and sophisticated mapping system that was applicable and seamlessly translatable to the operations of the Army Corps of Engineers, the Texas Forest Service and the City of Galveston.

Sanchez identified unreachable city and public works information as one of the most concerning issues she dealt with in her response to Hurricane Ike. To that end, she is working to improve the accessibility of municipal infrastructure information in the event of an emergency.

Texas Natural Resource Inventory System (TNRIS) already had a Texas data repository, which is how Sanchez found the street map of Galveston upon which to layer other data on the GIS map she produced while responding to Hurricane Ike. However, infrastructure and public works information as well as other information for emergency personnel was not preserved in the TNRIS repository. Sanchez has since worked with both TNRIS and the Columbia Center in Nacogdoches to create a server for Texas communities to replicate and store infrastructure data in multiple locations in order to have it protected and readily available in an emergency situation.