

GIS Use in the Hurricane Katrina Response and Recovery Efforts

Agency: New Orleans Regional Planning Commission

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The agency that we were assigned for this project was the New Orleans Regional Planning Commission (NORPC). Our contact person at the NORPC was Lynn Dupont, Environmental Planner and GIS Analyst. Ms. Dupont provided us with excellent insight into many different ways in which GIS was used by her agency during and after Hurricane Katrina. Understandably, Ms. Dupont is incredibly busy right now, and as we will discuss below, the downsizing of the City of New Orleans' Planning Department has shifted additional workload to Ms. Dupont. The first portion of this paper will discuss the NORPC's development of a GIS application that was originally intended for use by the Department of Transportation. As this paper will discuss, the application was put into use during the rescue phase of the response effort, and this adaptation was used by many rescue organizations. The second portion of this paper will discuss the NORPC's expanded role after the City drastically reduced its Planning staff.

Hurricane Katrina

The aftermath of Hurricane Katrina became the largest disaster in national memory. New Orleans is the center of a metropolitan area with over \$500 billion in real estate assets, *excluding* petrochemical and other industries. It is of great National economic importance. Besides, New Orleans is of great National historic and cultural importance. There are 19 National Register Districts with 38,000 properties. As many as 25,000 of these properties have sustained damage.

Background/Context

The New Orleans Regional Planning Commission receives much of its funding from state transportation agencies. Therefore, much of the NORPC's work is transportation-oriented. This is the case with a GIS application that was developed for the Louisiana Department of Transportation. This GIS application uses high-resolution imagery to identify city streets, highways and other infrastructure in the greater metropolitan area. The application linked these images with physical (street) addresses and global positioning coordinates. The original intent was for the Department of Transportation to use this tool in normal analysis of traffic patterns, future construction projects, and land use analysis. The utilization of this application took a dramatic turn after Hurricane Katrina ravaged New Orleans.

Emergency Response

As we have discussed this semester, emergency management planning in the New Orleans metropolitan area was limited at best. One aspect of emergency planning that was neglected was the development of an alternative way for emergency responders to locate and rescue citizens throughout the city. As levees around the city failed in the aftermath of the hurricane, the city filled with water. Naturally, all street signs, highway markers, and other directional tools were also under water. Many low-lying landmarks and other informal navigational tools became submerged. This development presented emergency responders with an additional hurdle – the challenge of locating people without normal navigational information. As the city flooded, many New Orleans

residents used cell phones to call for help. Unfortunately, when these residents provided a street address to the emergency dispatcher, this information had little useful value for emergency responders that were dealing with maps and street names of roadways under water. The lack of navigational information was particularly problematic for emergency responders using helicopters, specifically the Coast Guard. For one thing, some of these first responders were not from the area, which added to the burden of navigating a city under such difficult circumstances. Even for the first responders that were from the area, the challenge was incredibly complex. As various emergency response organizations recognized this incredible problem, they turned to local planning agencies for assistance. Thankfully, the GIS application that the NORPC and the DOT had developed was the ideal tool to solve this problem.

Adaptation/Adjustment

Ms. Dupont shared with us the story of how the NORPC's GIS application was used by emergency responders to break through the informational barrier. By linking street addresses with global position coordinates, first responders "in the field" had the information they needed to locate stranded citizens. The adaptation of the GIS that was originally developed for transportation analysis was a critical, life-saving tool used in response to the flooding that swallowed the city. In this respect, the GIS application had a very strong and direct influence on decision-makers and first responders.

The analysis that took place was analysis of existing GIS tools and how these tools could be used in new, unforeseen circumstances. Clearly, the application of an existing GIS to emergency conditions had a tremendous positive societal benefit. Critical

information was disseminated during a scenario of enormous stress and time pressure. The adaptability of GIS during unforeseen situations is clearly one of the benefits of such a dynamic tool. As we have discussed in class, successful emergency management is largely an exercise in contingency plan management. Evaluation of an agency's GIS capabilities and how these capabilities can be used for unconventional purposes is a recommended exercise for emergency planners and planners in every type of organization. Undoubtedly (and hopefully), this adaptation of the NORPC's GIS application has found its way into several different emergency planning documents that may be used in the future.

GIS and Rebuilding

After Hurricane Katrina, the City of New Orleans faced tremendous financial difficulties and the decision was made to lay-off many members of its Planning Department. This has meant that the New Orleans Regional Planning Commission has become one of the most important sources of GIS data and information for various institutions, organizations and individuals involved in various stages of rescue, recovery and reconstruction. The NORPC has had to pick up from where the planning department left and fill the gaps in map production. Engineering, educational and volunteer organizations from outside of the affected area that came to New Orleans after the hurricane have relied heavily on the GIS data and maps developed by the NORPC.

Ms. Dupont, as Senior Planner/GIS Coordinator for the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes has been the main contact for all of these organizations seeking information.

Information Presented to Decision-Makers

The NORPC provided maps, layers, land use contours, reports to the Bring New Orleans Back Commission for use in their planning process for the proposed light rail line out to the airport. The light rail is being designed as a viable transit option as well as an evacuation tool that would allow quick evacuation of the city. The Bring New Orleans Back Commission has used GIS to design the light rail line on the highest ground possible, given existing land use patterns.

Dissemination of Critical Information to Traffic Engineers & Others

The GIS data and maps have been especially beneficial for the traffic engineers that are coordinating the restoration of transportation arteries that provide access to the city. The engineers have been able to quickly reference the GIS maps to determine which areas are not affected and to create plans for redirecting traffic. The “Hands-on” volunteer group who came to New Orleans to help with reconstruction of housing relied on the GIS data provided by NORPC to coordinate their reconstruction efforts. Several Universities in the area have also utilized the NORPC’s GIS capabilities in formulating their recovery plans. Many agencies have been very appreciative of the NORPC’s assistance during the recovery efforts. We have attached a small sample of emails that demonstrate how much the NORPC’s assistance is valued.

Conclusion

In conclusion, the flexibility of GIS has been crucial during the Hurricane Katrina response and recovery efforts. The NORPC had an existing GIS application that linked high-resolution imagery with street addresses and global positioning coordinates. As the city filled with floodwater, street signs and other navigational tools became futile. Many rescue organizations turned to the NORPC for help and the existing GIS application was adapted for use in locating and rescuing citizens. The flexibility of this GIS application resulted in the quick dissemination of crucial, life-saving information. The NORPC's analysis of its existing GIS capabilities resulted in the identification of the perfect tool to address a complex, challenging situation. This GIS application had a strong, direct influence on the rescue efforts.

GIS has also been an incredibly valuable tool during the rebuilding efforts. The NORPC has provided countless organizations with GIS applications that are being used in the recovery and rebuilding of the area. These applications have been used by engineers, volunteers and various elected officials. Undoubtedly, GIS has had a major impact on the rebuilding of New Orleans. GIS is an incredibly flexible and efficient tool that the NORPC will continue to utilize as New Orleans recovers.