GIS IN EMERGENCY MANAGEMENT
THE USE OF GIS ON MAY 20, 2013 IN OKLAHOMA TORNADO

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Project Overview

We were interested in the way that GIS could be used to respond in emergency situations, particularly natural disasters. Because we are all residents of Oklahoma, we were especially interested in the tornado that took place on May 20, 2013. We began our research by looking up how GIS should ideally be used in emergency situations at each step of the emergency process (planning, risk-mitigation, preparedness, response, and recovery). We then found information about the use of GIS in May of 2013 and assessed how GIS was properly utilized by emergency responders, and how the response could have been improved with better utilization of GIS.

Research

GIS in Emergency Planning

Planning: GIS establishes locations that are most likely to be affected.

Risk Mitigation: GIS helps planners determine how to minimize damage (i.e. sirens, location, home location, emergency responders).

Preparedness: GIS helps establish response plans and prepares city for occurrence of disaster.

GIS in Moore, OK

The City of Moore did not fully utilize GIS in tornado planning because the city did not have full GIS capability. However, there were still well planned emergency systems in place.

Risk Mitigation

The city could not necessarily tell if a tornado would hit as highly populated area and it did. Still the emergency plans were to create maximum relief, though they did not necessarily alleviate risk.

GIS in Emergency Post-Emergency

Response: During or after a disaster takes place, GIS establishes most affected areas & equips first responders with geographic information.

Recovery: GIS maps locations most in need of services and resources; short-term deliverance of food, water, shelter; long term restoration of education, health, and sanitation services.

Expected Tornado Path

The Moore tornado touched down at 2:56 P.M. CDT in the rural Northwest city of Newcastle, Newcastle had 13 minutes of warning time. By the time the tornado reached Moore, OK, it had grown to be 1.3 miles wide with an EF-5 intensity and 200+ mph winds. Moore residents had a 36 minute warning time. At 3:35 P.M. the tornado dissipated leaving a 17+ mile destruction path after 39 minutes on the ground.

Statistics

- The Moore tornado touched down at 2:56 P.M. CDT in the rural Northwest city of Newcastle, Newcastle had 16 minutes of warning time.
- By the time the tornado reached Moore, OK, it had grown to be 1.3 miles wide with an EF-5 intensity and 200+ mph winds. Moore residents had a 36 minute warning time.
- At 3:35 P.M. the tornado dissipated leaving a 17+ mile destruction path after 39 minutes on the ground.

Damage & Census Tracts

GIS was useful in Moore where the storm was being. GIS was used to create nearly real-time maps that allowed FEMA to deliver resources 3-4 hours before they were needed.

GIS Post-Emergency

GIS in Moore, OK

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GIS in Emergency Post-Emergency

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Recovery: GIS maps locations most in need of services and resources; short-term deliverance of food, water, & shelter; long term restoration of education, health, and sanitation services.

Post-Event Recovery

Prior to the May 20, 2013 tornado event, the City of Moore barely did it at all reliance on GIS technologies to assist in planning for tornado events that have plagued this area in the past. This stemmed from not having the proper infrastructure or technology to fully take advantage of the help that GIS would bring to this area. This tornado in particular showed Moore the need for this type of information. Moore is just one of many small cities in the United States that need to move forward with their knowledge of GIS and the advantages it holds in times of crisis.

Conclusion


Works Cited


Dr. Trung V. Tran
Fundamentals of GIS