Passive Disaster Reporting Through Mobile Social Networking Technology

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BACKGROUND

There remains a recurring information problem for disaster responders: identifying the extent of damage immediately following an event. In large disasters, the initial "Where?" is seldom answered completely when needed most: during early response efforts. If the scope and magnitude of damage caused by an event is known, critical decisions can be made immediately. Without knowing the extent of damage - the location, type and severity of impacts - emergency responders cannot efficiently deploy or stage the life and property saving assets required to respond to an event.

Following hurricane Katrina, the Federal Emergency Management Agency (FEMA) made the initial damage assessment data (Figure 1) publicly available on September 5, 2007, six days after landfall. Subsequently, updated data depicting various levels of damage in specific geographic areas were released daily. While this data provided critical information about many hard-hit areas in the region, it did not provide the full "Big Picture" or support the overall situational awareness required. The majority of areas impacted by the hurricane were not represented in the available data. This lack of information potentially caused responders to erroneously believe that "no damage" had occurred in many areas, leading to problems in evacuations, resource deployment, and transportation of needed commodities.

DEVELOPING A SOLUTION

Harnessing information from citizens impacted by disaster events using available Social Networking Technology could result in a profound improvement in knowing the full "Big Picture". A web-based system, fed by a simple email address, capable of accepting large volumes of public-based messages and photos from mobile devices would dramatically contribute to the data collection effort. Add to this an intelligent methodology to transform these reports into usable geospatial data delineating the extent and type of damages reported, and a real-time data output product is available. Feed this into an associated online and public map-driven display, with an option to share the data with other users, and suddenly "Where?" can be identified.

Booz Allen Hamilton is developing the Geospatial Situation Awareness Tool (GSAT) which facilitates a centralized disaster information submission, automated geocoding addresses of locations affected by the disaster, and a subsequent real time estimation of the boundaries of the disaster. The tool enables the general public to submit information related to an active incident or disaster through the cell phone network using SMS text messages. The text messages typically contain an address and descriptive information such as extent of damage to property or the health condition of an individual. Once the text message is received at the central server, the message is parsed and the address portion of the message is geocoded to determine the location being referenced in the message. The resulting coordinates of the location are stored in a spatial database for display on a map. Additionally, the location is used in conjunction with other coordinates resulting from similar submissions to generate a disaster polygon. The disaster polygon is created by analyzing groups of coordinates based on their proximity to each other in time and in space. The polygon can then be used to better inform first responders and emergency managers concerning the extent of damage.

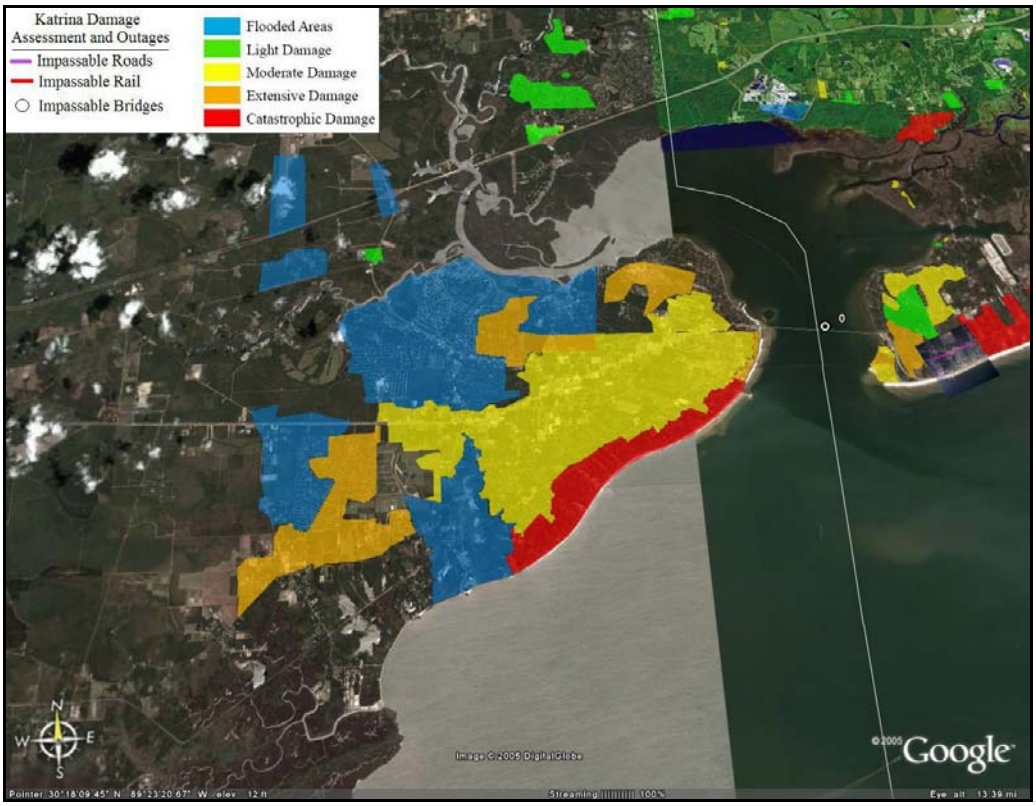

Figure 1: Katrina Damage Assessment and Outages on Google Earth