

## Chapter 68

# Participatory Mapping Approaches to Coordinate the Emergency Response of Spontaneous Volunteers after Hurricane Sandy

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### ABSTRACT

*This article demonstrates the potential of participatory mapping approaches to coordinate spontaneous volunteers and assist government agencies and humanitarian organizations in emergency contexts. The research focuses on one case study of a volunteer mapping project in the Rockaways in New York City to help communicate the needs reported by community members to outsiders after Hurricane Sandy. The map proved to be helpful in the coordination of relief efforts by volunteers and in understanding the variety of groups involved in emergency response. However, the map could not be sustained for long-term community recovery. The research offers new evidence of the potential contributions of spontaneous volunteers that can be leveraged, replicated and improved upon for future disaster planning and response. It also highlights the importance of volunteered geographic information in ensuring that emergency response is guided by the needs reported by citizens themselves, even if they do not have access to technology.*

### INTRODUCTION

This article provides an analysis of a participatory mapping approach to assist with emergency response after Hurricane Sandy. It focuses on

one case in particular: a volunteer project in the Rockaways, Queens, one of the hardest hit areas in New York City. Hurricane Sandy formed on October 22, 2012 and subsided on October 31, 2012, causing over 315 million USD in damages

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to the Caribbean and over 62 billion USD in damages to the United States, making it the second costliest hurricane in the history of the United States (Roca, 2012). Globally 285 people lost their lives, with at least 125 deaths in the United States (Roca, 2012).

Hurricane Sandy reached 725 kilometers beyond its core and affected 50 to 60 million people in the northeast region of the United States (Walsh, 2012). Sandy hit major urban centers such as Boston, New York City, and Atlantic City. During this time, over 7.5 million people were without power (Roca, 2012), which was not restored in some areas for several months. Blackout conditions made it unsafe to walk at night and in building hallways, and to enter and exit high-rise apartment buildings without working elevators. Portions of New York City were submerged under water, and many subway lines and regional trains cancelled service making the commute to Manhattan challenging for several weeks (McKenzie, 2012). Some subway lines, such as the A train which serves the Rockaways, were shut down all together with an estimated six months of repairs (Pereira, 2013). With wind speeds up to 145 kilometers per hour, trees were uprooted, roofs caved in, and some neighborhoods were flooded from a powerful storm surge (Silverman, 2012). Beach communities like the Rockaways were hit especially hard with waves over nine meters high that tore up boardwalks and eroded coastlines (Freedman, 2012).

Sandy prompted a substantial government response in the United States. For example, the Fire Department of New York (FDNY) had a major role in emergency response in New York City, building upon their experiences after 9/11 (2001), and Hurricanes Katrina (2005), Gustav (2008), and Irene (2011). However, the scale of need often overwhelmed their effective response because of the labor required for rescue operations. In one case during the peak of the storm, the FDNY was fighting the equivalent of three six-alarm fires simultaneously in Queens, one

of five boroughs in New York City (Daly, 2013; Esposito, 2013; Manahan, 2013). A typical six-alarm fire might consist of over 200 firefighters, including 25 engine companies, 13 ladder companies, nine Battalion Chiefs, two Deputy Chiefs, two Assistant Chiefs, the Chief of Operations, and a dozen or more special units for communication and injuries (Esposito, 2013). Despite these challenges, within three months after Hurricane Sandy, the FDNY and the National Guard had distributed approximately 6,400 blankets, 4,200 electric blankets, 3,300 cases of water, over 41,000 MREs (Meals Ready to Eat), 4,200 comfort kits (toothpaste, soap, etc.), 800 electric heaters, and inspected over 103,000 dwelling units (Daly, 2013; Esposito, 2013; Manahan, 2013).

Hurricane Sandy was an unprecedented event in New York City in terms of its environmental damage and regional economic impact. Media coverage of the event for those with power helped attract volunteers, and a surge of local residents began converging to help within the impacted regions. Although thousands of New York City residents assisted in a variety of ways, the lack of a coordinated volunteer response often led to a spatial mismatch between the needs reported by community residents and outsiders' perceptions of their needs in the impacted areas (Turk, 2012). For example, some organizations had to turn volunteers away because supplies were not available for them to distribute. In other cases, large numbers of volunteers went to serve in locations where there was no need for their response.

The emergency response to Hurricane Sandy was similar to other disaster situations, in which over stretched public services cannot adequately respond to the scale of need, and when a lack of coordination often hampers well-intentioned volunteer efforts (Fernandez et al., 2006a; *Managing Spontaneous Volunteers in Times of Disaster*, 2005; *Preventing a Disaster within the Disaster*, 2002). While research recognizes the important role of intra-governmental and volunteer coordination, it is less clear how these groups interact with

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