

Assessment of a flood prevention application for residents of the South Shore of Long Island, NY

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Introduction

During periods of precipitation and hurricanes, the South Shore of Long Island is prone to flooding. Due to the high risks of flooding for the people of South Shore of Long Island, a need for flood prevention is required to maintain a resilient society against natural hazards such as a flood. Using a survey of ten questions for twenty residents, our goal was to determine if those who were affected or unaffected by a flood would be interested in an application that would aid with flood prevention. Using a statistical software (SPSS), the data we collected were analyzed to study the statistical association between those who were and were not affected by flood wanting an app that would aid in flood damage prevention for residents. This study suggests that most residents were concerned about flooding in their area, and even if they have not yet experienced a flood in their home, they were still interested in a flood prevention application.

The South Shore of Long Island, including the towns located on the barrier islands such as Long Beach, Rockaway Beach, and Island Park, are all located in flood zones. Because these areas are located at a low elevation and nearby the shore, they are prone to flooding, especially during an event such as the superstorm Sandy and hurricane Irene. People south of the Sunrise Highway were most affected by the flooding. Homes and businesses were destroyed, and to this day, many people have not been able to move back into their homes yet. In Long Beach, post superstorm Sandy, the debris clean up cost the city over 100 million, which was more than the city's annual budget (Thomas Kaplan, 2012). With the way the trends look, major storms are becoming stronger and more frequent (Andrew Freedman, 2013), so it is important to gauge interest in the towns located on the South Shore about flood prevention and mitigation.

Methodology

Our approach to collecting data was done by conducting a ten question survey on a surveymonkey webpage. The survey comprised of questions that pertained to the area's history of past flood, how the flood affected the area and the people living there, and if the town is in need of an application that can provided ample warnings on the possibility of a flood effect may have. The survey was sent out to twenty people located in different regions of South Shore, Long Island. We took each of their responses to each questions and ran a Chi-square test and descriptive statistics on the data using the software SPSS. Google Earth and Global Mapper has facilitated our research to identify possible survey locations and to maintain those locations of the survey around the flood area (Fig. 1). A digital elevation model (DEM) with the pin locations was constructed using available terrain data (Shuttle Radar Topographic Mission; SRTM). Map resolution was purposely kept under low resolution to maintain the responders identity and their address anonymous.

Results

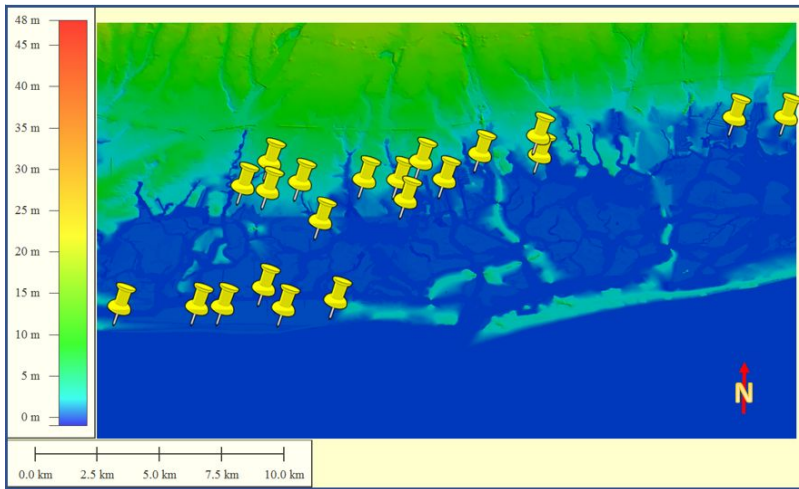


Figure 1. The pins show the approximate locations of the people who took our survey.

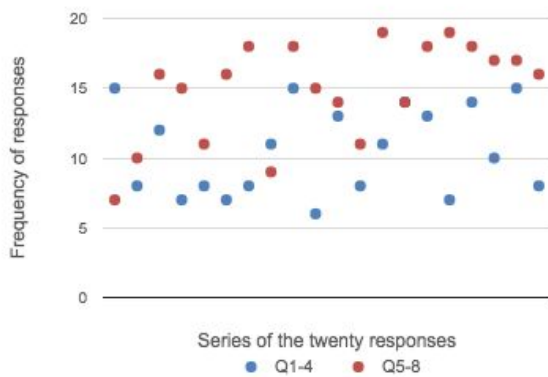


Figure 2.

The blue dots demonstrate the people who have and have not been affected by floods while the red dots demonstrate how much the people would like a mobile application for flooding. High frequency (blue dots) show responders who were severely affected by a flood. Low frequency shows responders who were not affected much by a flood. Whereas red dots of high frequency range show a high interest in a mobile application for flood alerts. Low frequency (blue dots) means they are less interested in the mobile application for flooding.

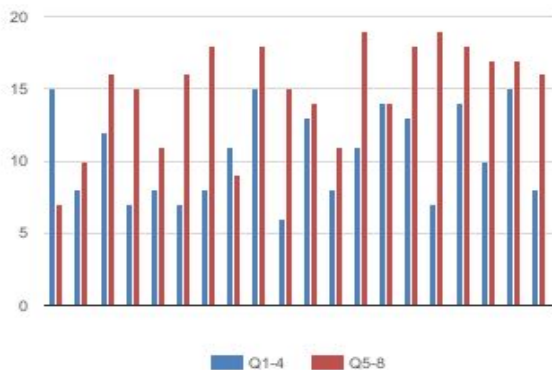


Figure 3.

The blue lines represent questions one through four which generalizes the amount of times a person was affected by a flood. The red lines show questions five through eight which generalizes the interest a person has about a mobile application for flooding.

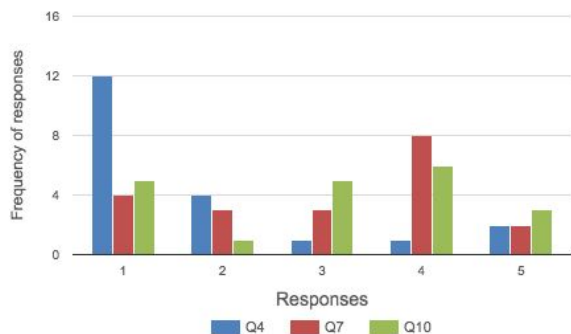


Figure 4.

This graph shows the statistical association between question four which shows how much money a person has spent in flood prevention, question seven which shows how much a person would like a mobile application for flooding, and question ten which shows if a person thinks a mobile application for flooding would help speed the recovery after a flood. The one to five scale on the x-axis shows how many surveyees responded to each question with choices ranging from one to five.

Discussion

After statistically analyzing our data using the software SPSS, we are able to conclude that there is no dependency between any of the questions. Our Chi square test result was calculated to be well over p-value of 0.05. This implies that none of the questions in the survey show any dependency between each other. This could be due to either the surveyees not being actual residents, such as renters, in the South Shore areas of Long Island. It could also be that our sample size consists of more than one category such as renters and owners.

Our data was collected only at the South Shore of Long Island where many of the surveyees are located nearby the sea level (Fig. 1). Most of these locations were destroyed during hurricane Sandy in 2011 due to the flooding therefore many people have shown a great interest in taking our survey. Residents who were affected by a flood show a strong need for the application (Fig. 2). At the same time, residents who were not affected by the flood still show a need for the application as well (Fig. 2).

We also analyzed the amount of times surveyees have been affected by flooding with the amount of money spent on flooding versus their interest in the flood application (Fig. 3). We were able to conclude from this comparison that our surveyees who were affected by flood events, strongly support that the utilization of a flood application would be beneficial. We were able to conclude that those who spent more money on flood prevention measures actually expressed a smaller need for the flood application and they felt that the application would not be as beneficial for emergency responders (Fig. 4). Comparatively, those who were spending little money on flood prevention measures, expressed a higher need for the application and felt that emergency responders would benefit greatly to the application (Fig. 4).

Conclusion

Flood concerns are high on the South Shore of Long Island due to the close vicinity to the ocean and the elevation which is barely above sea levels in some locations. Our survey was designed to get information on the need for a flood prevention mobile application that can potentially send out flood warnings, evacuation routes, and other groundwater information. While not all of our participants have been affected by flooding, we found that most people agreed that a flood prevention application would be beneficial to them during a flood event. If the residents were given the ability to receive information prior to a flood event, it could help with preparation for the event, if such an event should occur.

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