

# A GIS study of the Fatalities from Superstorm Sandy on Staten Island, NY

Alan I. Benimoff<sup>1</sup>, William J. Fritz<sup>2</sup>, and Michael Kress<sup>3</sup>



<sup>1</sup> Department of Engineering Science and Physics, College of Staten Island, Staten Island, NY 10314

<sup>2</sup> President, College of Staten Island, Staten Island, NY 10314

<sup>3</sup> Vice President for Technology, College of Staten Island, Staten Island, NY 10314

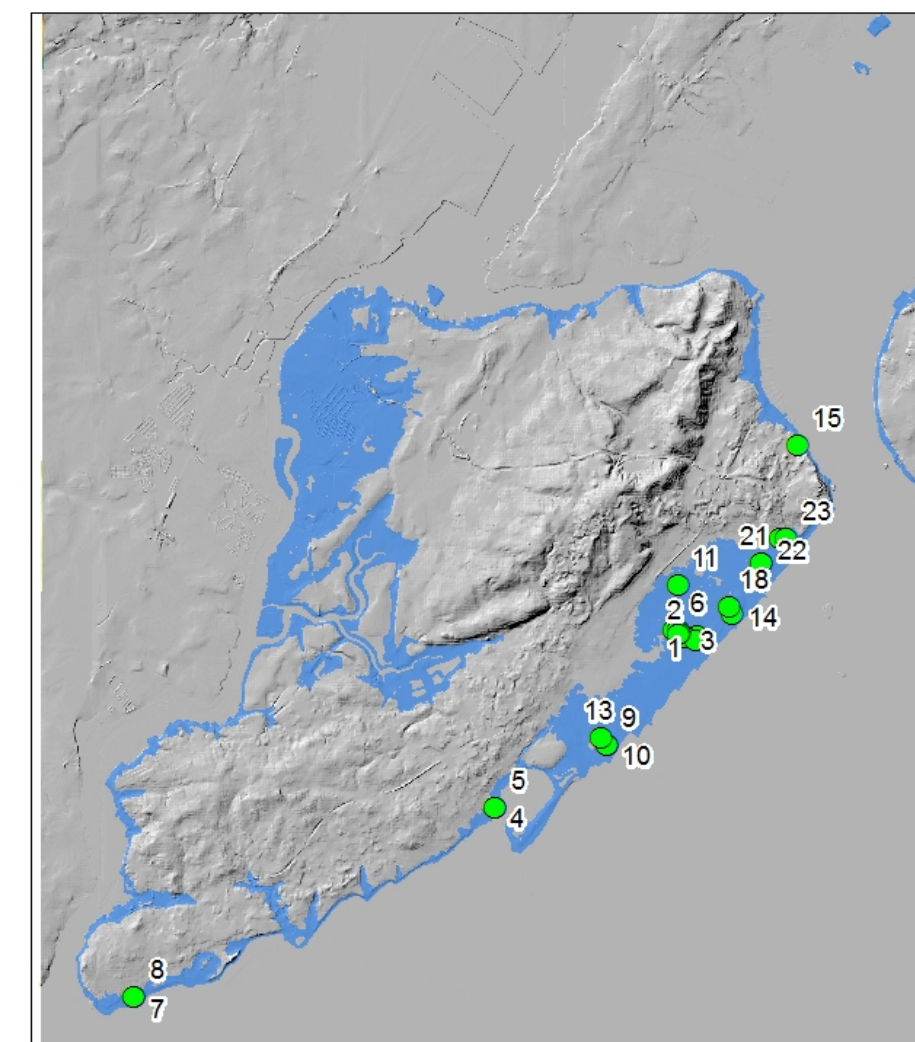
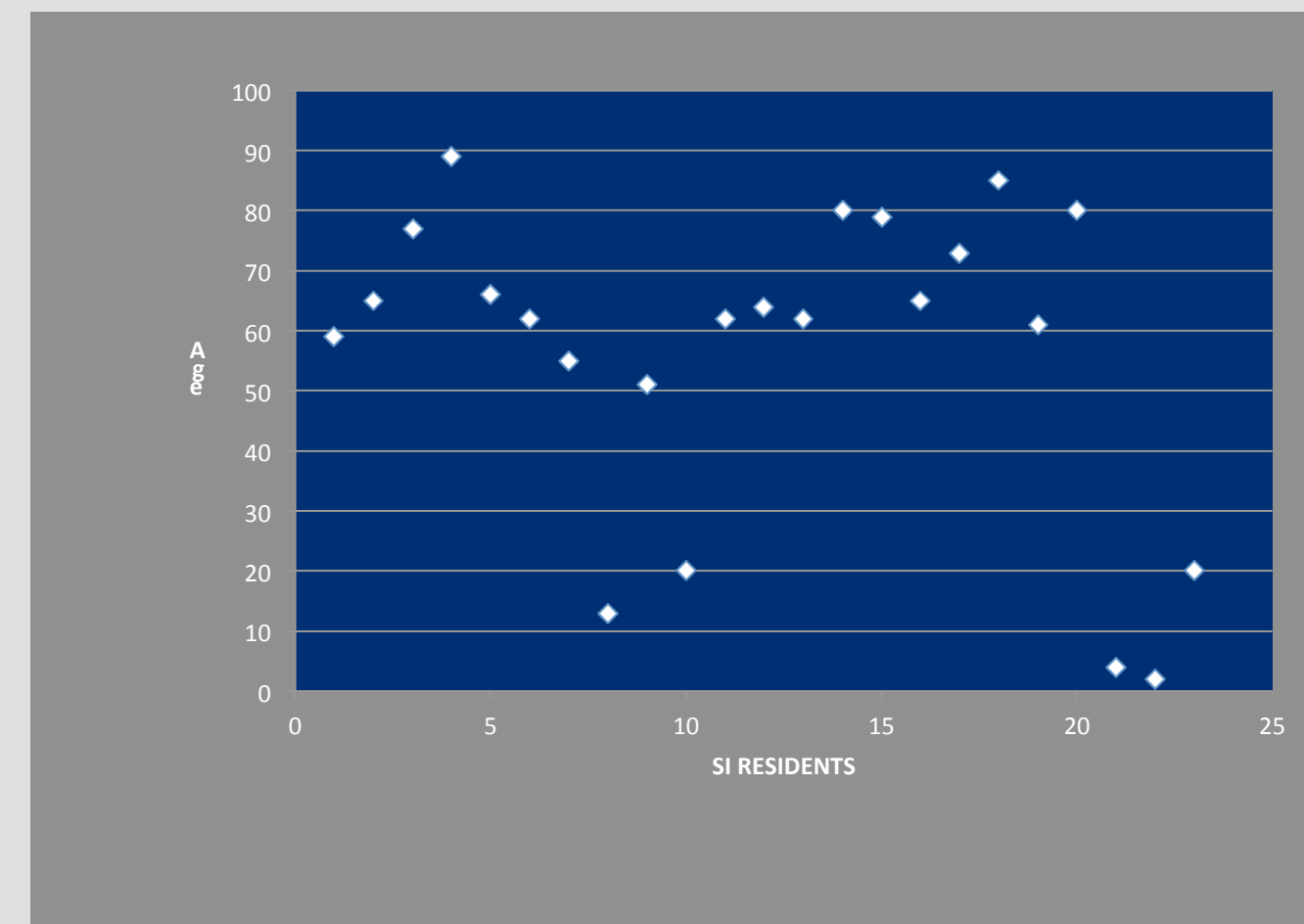


2014 GSA Annual Meeting in Vancouver, British Columbia

Wednesday, October 22, 2014, Session No. 303 - Booth# 104

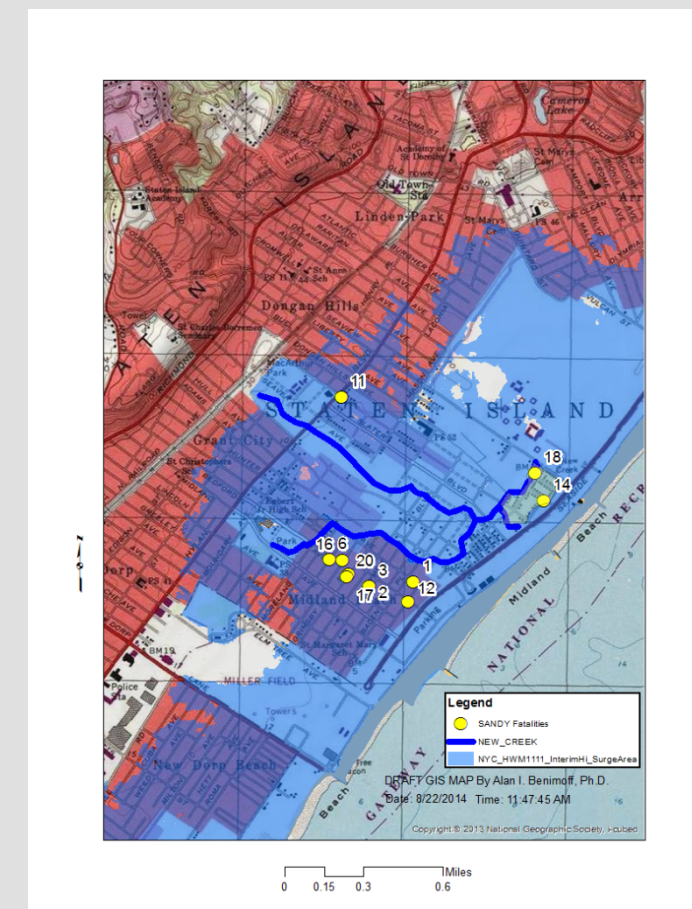


Using a GIS we have plotted fatality locations from Superstorm Sandy. Staten Island had 23 fatalities from Superstorm Sandy. Our GIS analysis shows that (1) the fatalities can be broken down into 2 age groups; Group 1 with 18 fatalities represents ages 50 to 89; group 2 with 5 fatalities represents ages 20 years old or younger. Two of the fatalities from group 2 were children ages 2 and 4 who were swept away in their parents' vehicle. None of the fatalities were from the age group 21 to 49. (2) All except one of the fatalities were located in pre-Sandy NYCOEM (New York City Office of Emergency Management) evacuation zone "A" which was under an evacuation order.



Green circles show locations of Fatalities from Sandy

0 1 2 4 Miles



1981 Narrows Quad

11 of the 23 fatalities occurred adjacent to the New Creek stream system which is comprised of former tidal channels according to the 1902 topographic USGS map.

This stream is being modified with BMP's (Best Management Practices) in storm water management and is part of what is now known as the New Creek "Bluebelt". Although this "Bluebelt" stream system was supposed to function to get storm water out into the ocean it actually served as a conduit to bring storm surge water in. In fact this stream system was able to carry the storm surge as far as 2.03 km inland. This surge extent was not realized anywhere else on Staten Island. Staten Island is very vulnerable to hurricane storm surge due to its geography.



1902 USGS Topographic Map

Since Sandy the NYCOEM has revised the evacuation zones to six (1-6). All but two of the fatality locations plot in the new NYCOEM Evacuation Zone 1. 5 of the 23 fatality locations plot inside the post-Sandy buyout zones of Governor Andrew Cuomo. Further GIS analysis shows in all cases the distance from fatality location to high-ground was less than 1.29km.

The Mayor of the City of New York issued an evacuation order for the then evacuation zone "A" prior to Superstorm Sandy. This study shows the importance of complying with emergency evacuation orders. High-ground was nearby. Since each hurricane is different it is important to evacuate when the orders are issued.

With modern communication we have to address getting the word out to those who couldn't evacuate. We also have to educate the population on where to go to high-ground. We have proposed signage that will aid in this.

