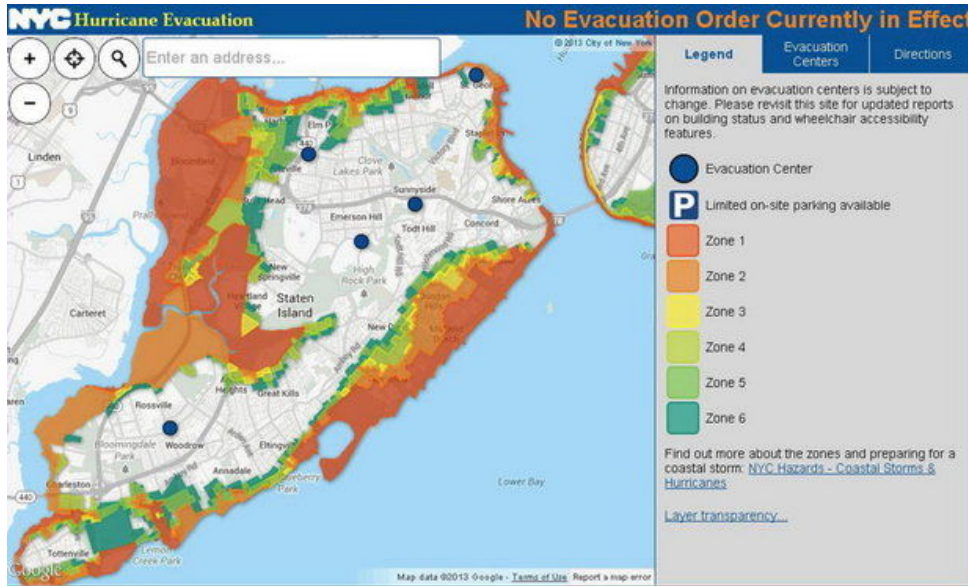


Hurricanes and Staten Island (commentary)



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Nearly 150,000 Staten Island residents live in one of the city-designated flood evacuation zones numbered 1 through 6.



By **Community Contributor**

on October 02, 2015 at 12:00 PM, updated October 02, 2015 at 12:04 PM

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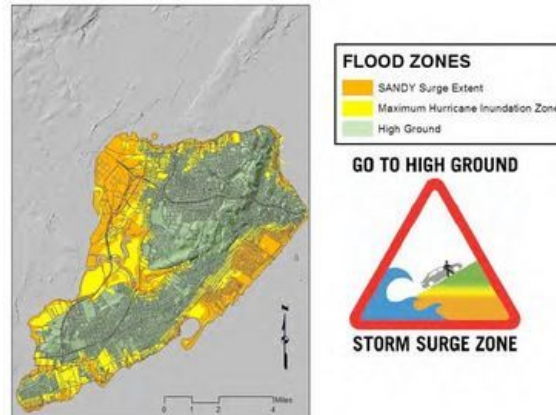
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By **William J. Fritz**

President, College of Staten Island

We are in the middle of the hurricane season. When I lived in the Caribbean for a time there was a saying: "June too soon, July stand by, August come they must, September remember, and October all over." With global warming, the season appears to be lengthening, as Staten Islanders

know only too well from Hurricane Sandy. Now it seems to be "...September remember, October remember, November not out of the woods yet...."

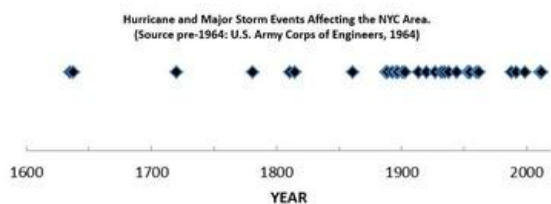


As I have written many times, New York City is in the hurricane belt. We don't get as many storms this far north as our southern neighbors, but when the hurricanes do come they can wreak havoc. Staten Island is particularly vulnerable. Low-pressure weather systems often draw storms with their devastating surges right into New York Harbor so that the hurricanes hit at a right angle to the shoreline. The sharp bend made by the north-south Jersey Shore and the east-west southern shore of Long Island presses the storm bulge and forces the water against Staten Island. We have a mile-wide strip of land along the shore that was below sea level in the late 1800s when sea level was a foot lower than today.

My colleagues and I at the College of Staten Island, Professor Alan Benimoff and Vice President Mike Kress, have determined that hurricanes with storm surges of similar magnitude to Sandy's have impacted the New York region on average about every 12 years since the 1600s. During much of this time no one noticed as the surges rolled across undeveloped marshland, marshes that today have thousands of homes. Today we must be mindful of natural processes in order to remain safe if we choose to live in harm's way. It is not safe to challenge Mother Nature.

This weekend we are all watching the track of Hurricane Joaquin and wondering, do we sit and watch or take action? We can run all of the computer models we want but in the end nature can surprise us, so it is *always* prudent to take action. The tragedy of Hurricane Sandy was the tragic loss of life and the needless loss of automobiles. Given the borough's inadequate public transportation, the loss of a car is an added misfortune that can mean the loss of a job in addition to the loss of a home. The good news is that most of Staten Island is high above the surge zone. There are a lot of safe places to seek shelter.

First, in the event of the hurricane striking our shore *go to high ground* and do not shelter in a basement. Going into the basement is the correct response for a tornado but not for a storm that has the potential of bringing torrents of debris-filled muddy water. Surges flood basements faster than you can get out. Climb to safety. Right now. If you live in a low-lying area (red or yellow on the map) you should prepare a "to go" kit with identification, credit cards, cash, essential medications, and a flashlight. Have it in an easily accessible place ready to take with you at a moments notice. Right now, look at a map and decide where to go. Park your car in a high area, if at all possible. If an evacuation order is given – evacuate! There is a lot of good emergency information on the New York City Office of Emergency Management website (www.nyc.gov/oem). Anyone who has survived a hurricane and did not evacuate when told will tell you that they would never ride out the storm again.



Keep in mind that we have experienced at least two different types of tropical storms in the past five years.

Hurricane Irene was a rain event with barely hurricane strength winds, only a small surge, but very heavy rain.

Basements all over the island

flooded, but slowly. Hurricane Sandy was a surge event with little rain and winds that were not even hurricane strength. But what if a storm had the rain of Irene, the surge of Sandy, and Category II or III winds? That is why I keep saying that Sandy was a relatively minor event, at least as hurricanes go.

I know many of us long for a seawall that will keep us from worrying about such doomsday scenarios, but a seawall, while it may help, is not the final answer. Our computer models show that seawalls can help but they can also be over-topped and make things worse by trapping surge water in a bowl behind the wall. Extreme rainfall and runoff coming from the highlands could exacerbate the problem in a really bad way. We need to account for compound flooding from both surges and rain occurring at the same time. Even if the seawall gets built it is still prudent to know where high ground is, to have a "to go" kit, and to think about where you can move family and cars to safety

to safety.

We need to have continued serious conversations in this country about how to protect life and property in the face of rising sea levels and a warming climate. The situation will get worse. Engineered solutions are very expensive and only temporary at best. Everywhere I travel on the East Coast, from Florida to Maine, I see new constructions of groins, jetties, seawalls, and breakwaters. All of these protect property at a price, often the loss of the beach. My concern is that billions of federal dollars are being spent hardening our coastlines without public policy discussions or comparing those costs to the cost of relocation or emergency planning. No one is discussing, "What value is the beach?"

It is sobering to think that the weather conditions that were in place just last Wednesday and if Joaquin was five days ahead of its present location, all the conditions would have existed for a path and strike similar to three years ago. Like all Staten Islanders, I hope that Joaquin will spare us, but as my mother always said, "It pays to be prepared."

More resources:

Definition of shoreline structures used to "harden" a beach can be found at:
http://www.beachapedia.org/Shoreline_Structures

More information on preparing a "to go" kit can be found at
<http://www1.nyc.gov/site/em/ready/get-prepared.page>.

Outside reading:

Kress, M.E., Benimoff, A.I., Fritz, W.J., Thatcher, C.A., Blanton, B.O., and Dzedzits, E., 2015. Modeling and simulation of storm surge on Staten Island to understand inundation mitigation strategies. In: Brock, J.C., Parrish, C.E., Gesch, D., Wright, C.W., and Rogers, J. (eds.), *Advances in Topobathymetric Mapping, Models, and Applications*. Journal of Coastal Research, Special Issue, No. 76, pp. x-xx. Coconut Creek (Florida), ISSN 0749-0208.

Benimoff, A I., Fritz, W. J., Kress, Michael, 2015, Superstorm Sandy and Staten Island: Learning from the past, preparing for the future in *Learning from the impacts of Superstorm Sandy*, J. B. Bennington and E. C. Farmer, eds., Academic Press (Elsevier), p. 21-40.

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