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A tide of concern is rising over risk of storm surges

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Photo by Terese Loeb Kreuzer

A view in August across the Hudson River to Jersey City from Lower Manhattan. Water levels have already risen due to climate change, according to experts.

BY TERESE LOEB KREUZER | A horror movie could not have been more frightening or more graphic. Hurricane-force winds. Sea levels rising 13 feet over the course of an hour. Thirty-foot storm surges destroying every manmade object in their path. Transportation systems flooded. No potable drinking water. Destroyed ecosystems. Beaches and barrier islands washed away. Two to three million people having to be evacuated.

This is what might happen if New York City were hit by a hurricane. Some of this is what has happened from time to time in the past but a future storm would probably be even worse. Climate change has already caused sea levels to rise even without the added stress and dangers of a storm.

According to David Bragdon, director of the Mayor's Office of Long-Term Planning and Sustainability, "By midcentury, New York City's average temperatures will rise by three to five degrees Fahrenheit, and sea levels could rise by more than two feet. By the end of the century, the city's climate may be more similar to North Carolina than present-day New York City and sea levels could rise by as much as four-and-a-half feet."

Much of the metropolitan area lies less than three feet above sea level and millions of people live close to New York City's 520 miles of coastline.

On Dec. 16 in a room packed to overflowing, the grim impact of climate change on New York City

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was depicted by expert after expert at a City Council hearing convened by James F. Gennaro, chairperson of the Committee on Environmental Protection, and Michael Nelson, chairperson of the Committee on Waterfronts. State Senator Tom Duane and Assemblymember Richard Gottfried testified that their districts are particularly vulnerable. Duane's district includes the Hudson River waterfront from Vestry St. to W. 70th St. and the East River waterfront between E. 14th and E. 30th Sts. Gottfried's district runs along the Hudson River waterfront from W. 14th St. to 59th St.

"Significant portions of our districts lie just above sea level and are therefore at risk from rising sea levels and storm surges," they said. "The high density of human population, infrastructure and enormous monetary and cultural value of existing buildings make adaptation to or mitigation of flooding impossible."

"New York City is planning to be flooded — and according to the National Hurricane Center, it will be," said Douglas Hill, consulting engineer and an adjunct lecturer at the School of Marine and Atmospheric Sciences at Stony Brook University. "Based on the historical record, hurricanes of Categories 1, 2 and 3 will strike the New York region on an average of every 17, 39 and 68 years, respectively."

He said that in a severe hurricane, the Office of Emergency Management has estimated that up to three million people would have to be evacuated from New York City.

There are three conceivable approaches to dealing with the threat of rising sea levels, said Malcolm Bowman, Distinguished Service Professor of Oceanography at the School of Marine & Atmospheric Sciences of the State University of New York at Stony Brook: The government could decide to do nothing because of lack of sufficient political will or funds; it could fix problems on a case-by-case basis as they arise; or it could take a regional approach.

Bowman noted that "the Dutch have been busily reclaiming and protecting their lowlands for centuries by creating an intricate network of dikes surrounding low-lying tracts of land." He said that Amsterdam, the capital of the Netherlands, with more than one million residents, in some places is built on land as much as 18 feet below mean sea level. The Dutch, he stated, "have a highly professional and established engineering, marine hydraulics and governmental infrastructure dedicated to building, maintaining and improving the country's coastal defenses against the sea. New York should do the same. The city should underwrite feasibility studies by engineering firms, city planners, environmental and community groups to investigate what will work and what will not."

Hill and other experts advocate protecting the city with strategically placed storm surge barriers. A storm surge is a mountain of ocean water propelled by the winds and low barometric pressure of a hurricane. According to the city's Office of Emergency Management, a storm surge can make landfall five hours before a hurricane hits and can also move in after a hurricane departs, as high seas slump back into confined spaces like Long Island Sound.

In a presentation before Community Board 2's Waterfront and Environment Committees on July 19, 2010, Hill described the potential effects of a tidal surge accompanying a category 1 or category 2 hurricane hitting New York City. The committees adopted a resolution asking the federal Army Corps of Engineers to conduct a study about the potential for flooding related to a storm surge and exploring the feasibility of installing sea gates and barriers, and taking other actions to protect New York City.

The C.B. 2 committees' resolution noted that the potential exists within the next 100 years for New York City to be hit by a major storm that could cause a tidal surge of up to 20 feet.

"The flooding caused by such a surge — which happened in the 19th century — would be calamitous," the resolution said, "particularly to those living within several blocks of the Hudson River."

As Hill explained to the committees, sea gates have been built in London and Rotterdam and are being built in Venice to protect those cities. He said that the total cost of building storm surge barriers beneath the Verrazano-Narrows Bridge and across the Arthur Kill and Throgs Neck would be around \$10 billion.

Community Board 4 has also pleaded with the city for protection. On Feb. 4, 2010, that board wrote a letter to Mayor Mike Bloomberg that said, "Much of Community Board 4 lies within the 100 Year Flood Plain." The letter asked that "the City petition Congress to appropriate necessary funds to enable the Army Corps of Engineers to begin studying the feasibility of installing sea gates and barriers for protection from the sea."

Quoting Joshua Friedman of the Office of Emergency Management, the letter went on to say that, "a catastrophic storm surge will affect two million New Yorkers, 740,000 households, 272,000

buildings and 461 miles of roadways. Recognized experts have suggested that sea gates at the Narrows, the mile-wide entry to New York Harbor, and lesser gates near Arthur Kill and where the East River meets Long Island Sound (Throgs Neck) would protect much of Manhattan.” The letter noted that the sea gates could protect against potential flooding caused by sea level rise alone, separate from the extra hazards caused by storms.

“There is no time to waste,” the letter said. “Whole communities may suffer irreparable damage if we don’t act now.”

These letters and warnings elicited no response. At the City Council hearing on Dec. 16, however, Gennaro did listen.

“The majority of Congress dismisses global warming as poppycock,” he remarked. Then he said of what he had heard that afternoon, “I would like the staff to know that this is an official interest of the chairman. This is my pledge to you.”

At least one person who sat through the hours of testimony that afternoon was more than elated by Gennaro’s remark. Robert Trentlyon, a former member of Community Board 4, has been fighting for recognition of the storm surge threat for years.



Photo by Terese Loeb Kreuzer

Storm clouds over New Jersey heading toward Lower Manhattan in August. Two weeks later, Tropical Storm Irene — which had weakened from a hurricane — hit New York.

“About three years ago, I realized that no matter what New York City did we would not be able to stop the rising sea level and would be victims to greater and greater storms,” he said. “I then went on a search for someone who knew about storm surge barriers. That led me to Doug Hill.” Due to Trentlyon’s involvement in community affairs, he soon had five community organizations on board to address the storm surge problem, including Community Boards 2 and 4. What transpired at the Dec. 16 Council hearing was a big breakthrough, in his view.

“Last Friday, at the City Council Oversight Hearing of the Environmental Protection Committee, presided over by James Gennaro, something wondrous occurred,” Trentlyon said last week. “David Bragdon, chairperson of New York City Long-Term Planning and Sustainability, announced that within six months his agency would commence the study of storm surge barriers. Michael Marrela, head of Waterfront Development for the Department of City Planning, announced that they have started studying storm surge barriers, and Jim Gennaro, in response to our testimony, said that his committee is prepared to help us, including talking to the Army Corps of Engineers. Christmas came early this year.”

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