Office of the
New York City Comptroller
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POLICY BRIEF

ON THE FRONTLINES:

$129 BILLION IN PROPERTY AT RISK FROM FLOOD WATERS

On the Frontlines: $129 Billion in Property at Risk from Flood Waters

Two years ago, Superstorm Sandy brought unparalleled devastation to New York City and forever exposed the risk posed by extreme weather to people and property in all five boroughs. A storm surge of over 9 feet swept into lower Manhattan as waves 10-feet high pummeled the Rockaways, and winds of 80 miles per hour swept across Staten Island.[1] Floodwaters inundated 46 square miles of the City, including many neighborhoods that were not in flood zones as defined by the Federal Emergency Management Agency (FEMA). All told, Sandy cost the City an estimated $5.7 billion in lost gross city product and a further $14 billion in private and public damages.

As part of a process that began in 2010, the Federal Emergency Management Agency proposed new flood insurance rate maps (FIRMs) in 2013 that dramatically expand the number of people and buildings in the flood zone. Over 400,000 New Yorkers now reside in the proposed, high-risk flood zones.[2]

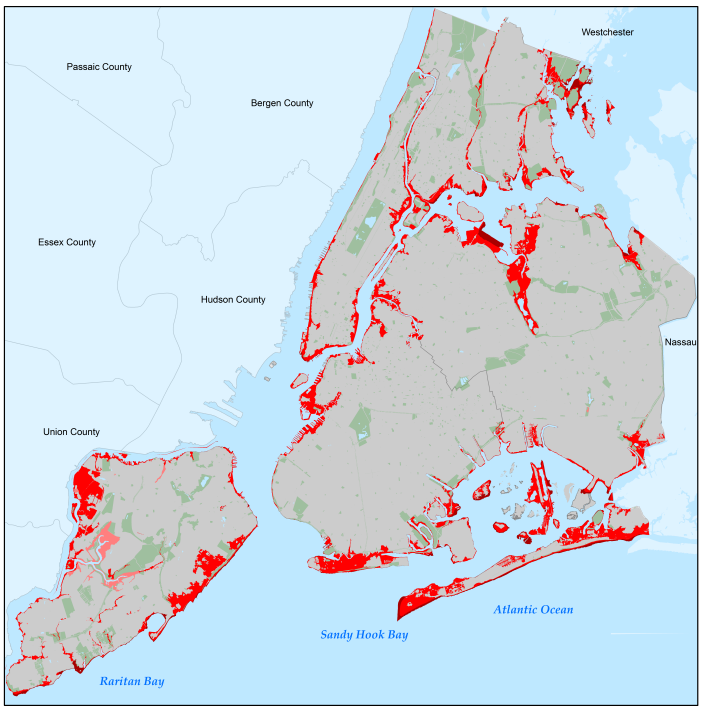
Based on a first-of-its-kind analysis of the updated FEMA maps, the New York City Comptroller's Office estimates that the value of property that lies within the 100-year floodplain is **$129,139,514,673**— an increase of more than 120 percent over previous maps. [3]

The breakdown by borough is as follow:

Table One: In the Flood Zone

	2010 Structure Count[4]	2010 Value	2014 Structure Count	2014 Value	Value Difference	Percentage Increase in Value
Manhattan	1,449	$22,238,617,525	4,051	$49,371,995,941	$27,133,378,416	122.01%
Brooklyn	5,648	$12,488,076,236	42,029	$36,420,237,402	$23,932,161,166	191.64%
Queens	8,246	$15,608,337,563	21,456	$29,305,027,964	$13,696,690,401	87.75%
Staten Island	6,079	$3,629,900,714	13,478	$7,630,214,704	$4,000,313,990	110.20%
The Bronx	2,463	$4,697,417,394	3,582	$6,412,038,662	$1,714,621,268	36.50%
Total	**23,885**	**$58,662,349,432**	**84,596**	**$129,139,514,673**	**$70,477,165,241**	**120.14%**

The value of buildings inside the proposed 100-year flood zones more than doubles in Manhattan and Staten Island, and rises by almost 200% in Brooklyn.[5]



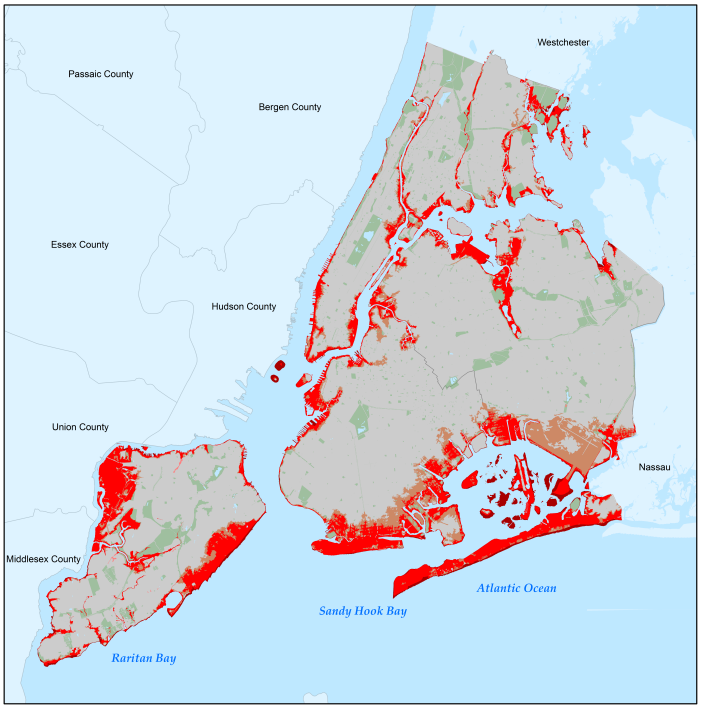
2010 NYC FIRM Boundaries

Map Version: October 2014
Data Source: NYC Department of Finance (AV Roll 2010, 2014), FEMA, www.region2coastal.com (FIRM Shapefile)

N

0 1.25 2.5 5 7.5 10 Miles
0 2.254.5 9 13.5 18 Kilometers

Flood Zone
- A
- AE
- VE



Proposed NYC FIRM Boundaries

Map Version: October 2014
Data Source: NYC Department of Finance (AV Roll 2010, 2014), FEMA, www.region2coastal.com (FIRM Shapefile)

N

0 1.5 3 6 9 12 Miles
0 2.5 5 10 15 20 Kilometers

Proposed Flood Zone Boundaries
Flood Zone
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- Zone AO
- Zone A
- Zone AE
- Zone VE

In short, FEMA's revised maps depict a greatly expanded floodplain that places almost three and a half times as many structures in high-risk zones and anticipates greater severity of flooding for those buildings already in the flood zone. This new landscape holds important implications for resiliency investments, flood insurance, and the role of government in protecting homeowners from the next great storm.

In order to ensure the City's physical and fiscal well-being against future weather events and mounting risk posed by climate change, this report recommends:

- Accelerating the pace of investment in resiliency projects and shoreline improvements. Federal grants will allow the City to transform its physical footprint so that our shores will be able to better withstand the threat posed by future storms.
- Calling on FEMA to expedite review of risks and premiums after the completion of large-scale resiliency work. Public investment should reduce premiums.
- Utilizing scientific research on flood risk and climate change to better inform municipal decisions and the City's capital plan.

The Need for Resiliency Investments

With such immense value arrayed along the City's coast, we must act now to make the necessary investments to protect our homes, our businesses and our neighborhoods from the future effects of climate change and the

NYC Property Assessment for 2010 FIRM

NYC Total: $58.6 Billion

Map Version: October 2014
Data Source: NYC Department of Finance (AV Roll 2010, 2014), FEMA, www.region2coastal.com (FIRM Shapefile)

N

Miles: 0 1.5 3 6 9 12

Kilometers: 0 2.5 5 10 15 20

Affected Buildings
Value (Dollars)

- 0 - 75,782,000
- 75,782,001 - 229,000,000
- 229,000,001 - 477,760,000
- > 477,760,000
- NYCHA Development
- Parkland

Property Assessment under Proposed FIRM Boundaries

NYC Total: $129.1 Billion

Map Version: October 2014
Data Source: NYC Department of Finance (AV Roll 2010, 2014), FEMA, www.region2coastal.com (FIRM Shapefile)

N

Miles: 0 1.5 3 6 9 12

Kilometers: 0 2.5 5 10 15 20

Affected Buildings

Value (Dollars)

- 0 - 75,782,000
- 75,782,001 - 229,000,000
- 229,000,001 - 477,760,000
- > 477,760,000
- NYCHA Development
- Parkland

potentially destructive force of another hurricane. While the costs of resiliency projects are high, investing in the City's future will pay enormous dividends, both to our waterfront communities and our broader economy.[6]

Studies indicate that every dollar spent towards resiliency and disaster mitigation will result in at least four dollars of potential savings.[7] Large-scale proposals designed to fortify and enhance the City's shoreline, like expansions to the Staten Island "Bluebelt" and the "Rebuild by Design" program, have the potential to transform the City's topography and protect our coastal areas.[8]

The City has significant resiliency funding at its disposal through FEMA and HUD Community Development Block Grant (CDBG) dollars, and recently has made concerted efforts to quicken the pace of Sandy-specific spending, especially through the Build it Back program. But the City has so far struggled to translate CDBG resiliency spending into on-the-ground infrastructure and coastal protection. As of last quarter, according to the Mayor's own Sandy Tracker, only $57,000 out of an allotted $284 million has been spent on dedicated resiliency projects, split between coastal protection and building mitigation.[9]

Insurance Reform

In addition to strengthening our shorefront communities, investments in resiliency projects could also limit the effect of rising flood insurance premiums on homeowners throughout the five boroughs. With the expansion of the floodplain, many more buildings will be required to purchase flood insurance.

Property-owners can purchase flood insurance through either the private market or the National Flood Insurance Program (NFIP). NFIP, which is administered by FEMA but often sold and serviced by private insurance companies, uses flood plain maps to determine insurance rates for homeowners.[10] The expansion of the 100-year flood zone, coupled with recent legislative changes made to the NFIP, means that mandatory insurance rates will potentially spike for thousands of New Yorkers, given the potential for more claims.

Under the current regulatory structure, rates may rise as much as 18 percent per year for similar levels of home coverage.[11] According to a model developed for the City by the RAND Corporation, many premiums will increase by $1,000 to $2,000 per year. In addition, the annual premiums for over 28,000 one- to four-family homes newly re-zoned into high-risk areas of the preliminary flood plain could soar from $429 to between $5,000 and $10,000 for the same amount of coverage.[12]

These dramatic increases pose an enormous hardship to thousands of New Yorkers. According to a study conducted by the Center for New York City Neighborhoods, over 30 percent of homeowners in the floodplain earn less than 60 percent of the New York City Area Median Income.[13]

In some cases, property owners can reduce their exposure to high premiums by physically elevating their building above Base Flood Elevation, a complex and expensive process.[14] The City estimates that over 26,000 buildings in the floodplain have characteristics that make elevation either "enormously challenging" or even impossible.[15]

Large-scale resiliency projects, with potential to reduce a region's exposure to flooding, should also have the potential to lower rates. However, FEMA is under no obligation under current rules to regularly review and update premiums despite the fact that the installation of coastal protections—including surge barriers, artificial reefs, dunes, jetties, living shorelines, and floodwalls—are proven to help stem the effects of localized flooding and substantially lower flood risk.[16]

Far from responding dynamically to improvements in real-time, FEMA's process for reassessing its flood maps is excruciatingly slow. The currently proposed maps, which are due to take effect in 2016, were initiated in 2010 and as a result do not even take into account flooding patterns observed during Superstorm Sandy.[17] With $129 billion in property potentially at stake, it is crucial that FEMA more regularly update its mapping in response to flood data and changes made by resiliency projects.[18]

Indeed, in coming years, as a result of federal spending, New York's landscape will be transformed by resiliency projects designed to protect our shores, much of it funded by FEMA's own dollars. New Yorkers should not have to wait decades to see investments in coastal resiliency reflected in FEMA maps ***and*** in insurance rates. Instead, FEMA should be required to regularly review the efficacy of implemented resiliency measures on a regional basis, with an eye toward reducing premiums for homeowners in region's that have chosen to invest in fortifying their shorelines. Such a policy would provide a powerful incentive for regions to invest in more resiliency infrastructure, while also providing homeowners with a measure of potential relief.

This more frequent review of resiliency efforts will also save taxpayers money more broadly, since FEMA requires New York City to carry insurance. While the City usually "self-insures" against flooding or other disaster related damages, the City will be obligated to carry hazard insurance on buildings that received assistance from the Federal Government in the wake of Sandy.[19] Buildings repaired with federal funding will have to secure $500,000 of building insurance and $500,000 of contents insurance. In testimony before the City Council in March, the Office of Management and Budget estimated that the City's total insurance premium could amount to between $5 and $10 million annually.[20]

The City should seek to mitigate the exposure of City assets to climate change by requiring agencies to account for climate risks in the planning and siting of future capital projects. Governor Cuomo recently signed into law legislation that attempts to coordinate scientific research on climate risk with permitting, funding and regulatory policy.[21] This legislation could serve as a potential model for the City.

Using the City's own estimates of the effects of climate change, City agencies should proactively address risk and build in a resilient manner.

Conclusion

Sandy's historic impact is still being felt two years later, highlighting what New York has at stake in an era of rising tides and more frequent storms. By investing in resiliency projects that will safeguard our shorefront communities, our businesses and our neighborhoods, the City will not only protect $129 billion in assets, but also the lives and wellbeing of its citizens. That's money well spent.

Endnotes

1. http://www.nhc.noaa.gov/data/tcr/AL182012_Sandy.pdf.
2. http://cnycn.org/wp-content/uploads/2014/09/Rising-Tides-Rising-Costs-2014_compressed.pdf.
3. Department of Finance Assessed Value data for 2010 and 2014 were spatially joined to 2010 and 2014 FIRM shapefiles, provided by FEMA. Once joined, a query was run to determine the number of buildings located within the 2010 and 2014 FIRM boundaries. Affected buildings were exported as dbf files and totaled to assess boroughwide and city-wide values. Duplicate properties were then removed as property value is assessed by lot.
4. NYC Department of City Planning Building footprints data was spatially joined to 2010 and 2014 FIRM shapefiles, provided by FEMA. The data includes all public and private structures.
5. When controlling for property appreciation, changes in the City's tax code and other factors, the new maps account for $57 billion in added property value in the floodplain ($70 billion in today's dollars). To assess the property value while holding for other factors, the 2010 FIRM map was applied to the 2014 assessments referenced above. The difference of these two numbers accounts for the value of the property added holding all other factors equal. When the 2014 FIRM is applied to the 2010 property values using the same method, the difference is $53 billion.
6. Large scale resiliency projects and coastal protections are particularly crucial in New York City, as so much of the City's building stock is resistant to flood proofing measures, especially elevation. A preliminary analysis by the New York City's Mayor's Office has found that 39% of buildings in high risk zones reside on narrow lots or are attached/semi-attached housing stock, making them very difficult to elevate.
7. http://www.dhs.gov/news/2014/04/03/written-testimony-fema-house-transportation-and-infrastructure-subcommittee-econom-0.
8. Rebuild by Design is a HUD program centered on large scale resiliency projects. The program will deliver $335 million for a sea-berm hugging the Lower East Side, $60 million for a living breakwater along Staten Island's South Shore and $20 million for a study on resiliency options for the Hunts Point food distribution center in the Bronx. In addition to these large-scale projects, the City should continue to invest in infrastructure that reduces flooding in neighborhoods inside and outside the floodplain. As illustrated in the Comptroller's July ClaimStat report, sewer overflow continues to be a problem in many inland neighborhoods, which reinforces the need for continued investment in making the City's sewer network more resilient to the effects of extreme rainfall. The City has already made an enormous effort in ensuring a more resilient New York through its PlaNYC programs, and should continue to dedicate effort and funding to these crucial projects.
9. http://www1.nyc.gov/sandytracker/#15; FEMA spending in particular is heavily geared towards rebuilding to resilient standards. The spending figures above refer only to CDBG dollars allotted for new and innovative resiliency work.
10. Insurance is available to all property owners but mandated for buildings located in the 100-year floodplain which have federally backed mortgages on the property.
11. https://www.congress.gov/bill/113th-congress/house-bill/3370.
12. http://www.rand.org/content/dam/rand/pubs/research_reports/RR300/RR328/RAND_RR328.pdf.
13. http://cnycn.org/wp-content/uploads/2014/09/Rising-Tides-Rising-Costs-2014_compressed.pdf.
14. http://www.fema.gov/media-library-data/1385402350525-0854e30dc59e2567554b87bc3cc94e36/SandyRA7ReducingFloodRisk_111913-508.pdf.
15. http://www.nyc.gov/html/sirr/downloads/pdf/final_report/Ch5_Insurance_FINAL_singles.pdf, p.99-100.
16. http://www.nyc.gov/html/dcp/pdf/sustainable_communities/urban_waterfront_print.pdf.
17. http://docs.nrdc.org/water/files/wat_14030701a.pdf.
18. Additionally, FIRMs do not include estimates of the effect on climate change on future flooding. As the effects of climate change accelerate in the 21st century, FEMA should revisit at even more frequent intervals to chart the effect of sea level rise on flooding risk.
19. After an agreement with FEMA, 14 categories of City infrastructure like roads and parks, are exempt from the requirement.
20. http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=1690323&GUID=B1C553F5-09DD-4291-B743-CEB6A3782C97&Options=&Search=.
21. https://www.governor.ny.gov/press/09222014-resiliencyact

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