A more resilient NYC is one where neighborhoods, buildings and infrastructure can withstand and recover quickly from flooding and climate events.

Coastal defenses are strengthened as first line of defense against flooding

*Corps of Engineers, NYS DEC, NYC DPR*

**Buildings**
are designed to withstand and recover from flooding

*FEMA, DCP, DOB, HRO, NYCHA*

**Infrastructure** is protected from climate hazards

*DOT, DEP, DDC, Utility Companies, MTA*

**Residents and businesses** are prepared

*OEM*
Flood Resilience Zoning Projects at DCP

2013
“Flood Text” initial temporary regulations to facilitate recovery

2018
“Flood Text Update” improve upon, and make permanent, the Flood Text
Zoning for Flood Resilience
Overview of DCP’s Timeline

As part of this outreach process, DCP has been:

- Partnering with stakeholders to educate and promote awareness of flood risk and resiliency issues
- Explain how zoning tools relate to resiliency
- Explore unique neighborhood issues through in-depth public presentations and workshops
- Develop a proposal through an iterative process that is shaped by feedback

* Schedule is tentative and subject to change
How are buildings in the floodplain regulated?

**Flood Insurance Rate Maps (FIRMs)**
Determine *where floodplain regulations apply*

**National Flood Insurance Program**
Set up *Insurance Rates* depending on building elevation and other requirements

**Construction Standards (ASCE 24)**
Design *minimum construction requirements* for flood hazard areas

**Building Code (DOB)**
*Requires* new buildings and substantial improvements to meet FEMA standards

**Zoning Resolution (DCP)**
Zoning *accommodates* these regulations and improves neighborhood character
Flood resilient construction
Required by DOB

Required for all new buildings

Not required for existing buildings (unless substantially damaged or improved)

Substantially Damaged: Restoring Cost ≥ 50% Market Value
Substantially Improved: Improvement Cost ≥ 50% Market Value
Flood insurance rates
Set by FEMA

Raising or retrofitting your building or home will reduce costs

FEMA’s flood insurance premiums are lowest when the lowest inhabited floor (any area not used solely for storage, access or parking) is elevated above the Base Flood Elevation (BFE).

- 4 FEET OR MORE BELOW BFE: ~$9,000 Annual premium
- AT BFE: ~$1,400 Annual premium
- 3 FEET OR MORE ABOVE BFE: ~$450 Annual premium
Key Findings/Next Steps

- Many neighborhoods including Canarsie will be especially hard hit when risk increases and rates move toward actuarial rates. Rates could reach up to $4000 a year.

- City is advocating that FEMA explore more cost-effective retrofitting strategies.
NYC’s flood risk is high.

The floodplain affects a large geography and most community and council districts.

100 Year Floodplain
FEMA 2015 PFIRM

Population: **400,000**
Buildings: **71,500**

- **50** of 59 Community Boards
- **45** of 51 Council Districts

**Buildings:**
- **80%** 1-4 units
- **7%** 5+ units
- **13%** nonresidential

**Residential Units:**
- **30%** 1-4 units
- **70%** 5+ units
# Future Flood Map

## Flood Risk in CD 13

<table>
<thead>
<tr>
<th></th>
<th>2015 PFIRMS</th>
<th>2050’s Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>R units in floodplain</td>
<td>42,600</td>
<td>45,850</td>
</tr>
<tr>
<td>Buildings in floodplain</td>
<td>7,330</td>
<td>7,760</td>
</tr>
</tbody>
</table>

- **8%** increase in R units in floodplain
- **6%** increase in Buildings in floodplain
South Brooklyn
Building Typologies in the Floodplain

- **Attached buildings** – 2-3 story, parking on ground level
- **Large scale apartment buildings** – 6+ stories
- **Mixed-use apartment buildings** – 2-6 stories, ground floor retail
- **Small bungalows** – 1-2 stories, detached, wood frame
- **Larger homes** – 2-3 stories, masonry and wood frame
- **Commercial corridors** – 1-2 stories buildings with parking
Flood resilient construction
Required by DOB

Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).

Base Flood Elevation (BFE) is the expected height of flooding from the 1% annual chance flood.

Design Flood Elevation (DFE) is the BFE + freeboard of 1-2 feet for additional margin of safety.

Living spaces are elevated above DFE.

Mechanical systems are elevated above DFE.

Site is filled to lowest adjacent grade.

Use below DFE is restricted to parking, storage or access.

WET FLOODPROOF (Water comes in and out)

Building Code (DOB)
Flood resilient construction
Examples of Residential Buildings

Residential Building
Elevated to DFE

Residential Building Under Construction
Elevated to DFE
Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).

**Base Flood Elevation (BFE)** is the expected height of flooding from the 1% annual chance flood.

**Design Flood Elevation (DFE)** is the BFE + *freeboard* of 1-2 feet for additional margin of safety.
Flood resilient construction
Examples of Residential Buildings

Residential Building
Elevated to DFE ~ 5 feet above grade

Ground floor used for parking and access

Residential units are elevated above the DFE

Wheelchair lift in front yard
Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).

**Base Flood Elevation (BFE)** is the expected height of flooding from the 1% annual chance flood.

**Design Flood Elevation (DFE)** is the BFE + *freeboard* of 1-2 feet for additional margin of safety.

Living spaces are elevated above DFE.
Flood resilient construction
Required by DOB

Deployable floodgate
(currently allowed only at doors and operable windows)

Aquarium Glass
(‘aquarium-grade’ glass for glazing or curtain-wall systems)
Flood resilient construction
Examples of Commercial Buildings

Commercial Ground Floor
Existing Building with access at grade (deployable flood shields)

Commercial Ground Floor
Elevated to DFE ~ 1 foot
Flood resilient construction NYCHA’s Recovery Program

www1.nyc.gov/site/nycha/about/recovery-resiliency.page
2013 Citywide Flood Text
Temporary Rules

Main Goal
Facilitate Recovery from Hurricane Sandy

2013: Temporary provisions that allow storm-damaged and new buildings to comply with higher flood elevations and resilient construction requirements by removing zoning barriers.

2015: Accelerate post-Sandy recovery in certain areas by simplifying documentation requirements and removing disincentives to resiliency investments, through 2022.
2013 Citywide Flood Text
Amended zoning in six key areas

1. Height
   Measured from flood elevation

2. Access
   Flexibility for stairs, ramps, lifts

3. Parking
   Flexibility to relocate parking

4. Systems
   Flexibility to relocate/elevate

5. Ground Floors
   Account for costs of new flood risk

6. Streetscape
   Require features to mitigate blank wall
Flood Text Update
Permanent Rules

Goal 1
Facilitate Recovery from Future Storms by making the provisions of the temporary Flood Text permanent.

Goal 2
Promote Long-Term Resiliency by encouraging proactive retrofitting and development that is safe in the long run.

Goal 3
Enhance Neighborhood Character by encouraging good resilient design within coastal communities.
Zoning for Flood Resilience Update
Issues identified by DCP and coastal communities

1 Subgrade Spaces
Homeowners may face the loss of subgrade spaces when retrofitting.

2 Future Flood Risk
Property owners may want to address future risk or reduce insurance by over-elevating.

3 Old neighborhoods
Old buildings may need more flexibility to rebuild, elevate, or retrofit to resiliency standards.

4 M Districts
Existing homes in Manufacturing Districts, may not be able to rebuild.

5 Active Uses
Current incentives and use options to keep active ground floors, may not be enough.

6 Active Streetscapes
Design requirements may be needed to mitigate the effects of elevated buildings.
Zoning Community Workshop
Coney Island YMCA - October 18, 2017

**STEP 1**
Pick a building in your neighborhood. It can be the place you live, work or are interested in!

**STEP 2**
Build the existing conditions of your building with available cut-out cards (black and white).

**STEP 3**
Place your flood elevation (low, medium or high) above existing building and check your risk.

**STEP 4**
Retrace your building to become resilient by using available cards (colored).

**STEP 5**
Add the zoning envelopes that reflect your neighborhood’s zoning above the flood level.

**STEP 6**
Check if there are any zoning conflicts. Does the retrofitted building fit within the envelope?

**STEP 7**
Add your building to the wall and imagine how your neighborhood could look like!

**STEP 8**
What do you think about the results? Add a post-it with your thoughts on the wall.
Resources

NYC Flood Hazard Mapper
www.nyc.gov/floodhazardmapper

Info briefs on Flood Resilience Zoning, Flood Risk, Flood Resilient Construction, and Flood Insurance (available in 6 other languages!)
www.nyc.gov/resilientneighborhoods
Resources

FloodHelpNY
Everything you need to know about flood insurance and your flood risk

- Find Your Property on the New Proposed Flood Map
- See How Map Changes Could Affect Your Insurance Rate
- Get Tips and Resources to Protect Your Home
- Stay Updated on Changes to Flood Insurance Policies

FloodHelpNY.org
Resources

FloodHelpNY
Everything you need to know about flood insurance and your flood risk

3 out of 4
homeowners in high-risk zones without an elevation certificate are overpaying for flood insurance.

Resiliency Report
After we inspect your home and assess its flood risk, we’ll send you a detailed technical report, complete with measurements and information on which retrofits (i.e., raising your mechanical systems) can make you more flood-safe.

Elevation Certificate
We’ll also send you a document that certifies your home’s elevation. If you live in a high-risk flood zone, the elevation certificate can keep your flood insurance rate from skyrocketing.

FloodHelpNY.org