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 and sea level rise.

Buildings are designed to withstand and recover from flooding.

Infrastructure is protected from climate hazards.

Residents and businesses are prepared.
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
FEMA Flood Map
Flood Risk in Manhattan

2015 PFIRMs*

<table>
<thead>
<tr>
<th>Population in Floodplain</th>
<th>89,100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings in Floodplain</td>
<td>3,100</td>
</tr>
</tbody>
</table>

*Area where Building Code and Zoning applies
Future Flood Map
Flood Risk in Manhattan

<table>
<thead>
<tr>
<th>2015 PFIRMs*</th>
<th>2050s Projected</th>
</tr>
</thead>
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*Area where Building Code and Zoning applies
### Future Flood Map
#### Flood Risk in MN CB 3

<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>20,980</td>
<td>29,060</td>
</tr>
<tr>
<td>Buildings in floodplain</td>
<td>500</td>
<td>980</td>
</tr>
<tr>
<td>% buildings in MN CB 3</td>
<td>11%</td>
<td>21%</td>
</tr>
</tbody>
</table>

*Area where Building Code and Zoning applies*
Buildings in the Floodplain in Manhattan
How are buildings in the floodplain regulated?

**FEMA**

**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

*None of these regulations alter the Landmark Preservation Commission (LPC) review of all modifications and new buildings in historic districts. Resilient retrofits would not be permitted without public input and LPC approval.*
Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).

- **Required for all new buildings**
- **Not required for existing buildings** (unless substantially damaged or improved)
Flood resilient construction
Examples of Residential Buildings

Residential Building
with access at grade (wet-floodproofed)

Residential Building
Elevated to DFE – 3’ above grade
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).

- **Required for all new buildings**
- **Not required for existing buildings**
  (unless substantially damaged or improved)
Flood resilient construction
Examples of Commercial Buildings

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

Commercial Ground Floor
Elevated Retail
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

Flood Resilience Text Amendment

Flood Resilience Text Amendment II
2018
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
Lessons learned since 2013
Encouraging resilient construction

Based on these filings, only 1,600 (2%) of the 71,000 buildings in the floodplain will be fully flood resilient.

The zoning relief we provided may not be achieving our goal of increasing code-compliant, flood-resistant projects.

DOB Permit Filings
in the flood hazard area, 10/2013 – 1/26/2016

<table>
<thead>
<tr>
<th>New buildings</th>
<th>Major alterations (Alt-1)</th>
<th>Minor alterations (Alt-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>1,021 of 1,021</td>
<td>113 of 1,090</td>
<td>532 of 15,573</td>
</tr>
<tr>
<td>meet full resiliency standards</td>
<td>meet full resiliency standards</td>
<td>meet full resiliency standards</td>
</tr>
</tbody>
</table>

- New buildings
  - 149 (14%) approved
  - 451 (44%) underway
  - 179 (17%) complete
  - 25% rejected/pending

- Major alterations (Alt-1)
  - 36 (31%) approved
  - 24 (21%) underway
  - 0 (0%) complete
  - 48% rejected/pending

- Minor alterations (Alt-2)
  - 245 (46%) approved
  - 122 (23%) underway
  - 9 (1%) complete
  - 30% rejected/pending
Flood Text Update
Need for a new citywide text amendment

1. Make the provisions of the current, temporary 2013 Flood Text permanent

2. Fix and improve provisions based on studies, lessons learned, and outreach

3. Begin to promote new development + proactive retrofitting to high resiliency standards
As part of this outreach process, DCP will:

- **Partner 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*
Outreach Resources

NYC Flood Hazard Mapper
www.nyc.gov/floodhazardmapper

Info briefs on Flood Resilience Zoning, Flood Risk, Flood Resilient Construction, and Flood Insurance
www.nyc.gov/resilientneighborhoods
Thank you!

For more information, and to stay involved, email 
resilientneighborhoods@planning.nyc.gov
FIRM vs. PFIRM

**FIRM**
1983; digitized 2007
Currently used for flood insurance purposes

**PFIRM**
2013, revised 2015
Currently used for building code purposes

**Post-appeal PFIRM**
Expected 2019+
Affected geography unknown

Not actual map – illustrative only
Flood Text II
Fix and improve provisions based on lessons learned

1 Height
Homeowners may face the loss of subgrade/at grade spaces when retrofitting

2 Height
Properties owners may want to address future risk by over-elevating

3 Ground Floors
Current incentives to keep active ground floors may not be enough
Height
Improvements and lessons learned

ISSUE

The 2013 Flood Text doesn’t provide a solution for non-raisable building typologies:

Homeowners may face the loss of subgrade/at grade spaces when retrofitting.
Height
Improvements and lessons learned

The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation. Although, it may still prevent certain access solutions in “packed” envelopes, and it may discourage long-term planning:

**ISSUE**

Properties owners may want to address future risk by over-elevating.
Commercial Ground Floors
Improvements and lessons learned

ISSUE

• Bad urban design outcomes due to “squishing” – dark, low-ceilinged establishments.

• Causes lower-grade commercial stock, limits the types of retail tenants and services that can locate in the building, such as restaurants.

• Doesn’t apply to at least half of the floodzone.

• Doesn’t create a zoning incentive to prefer dry floodproofing implementations over wet floodproofing (active over passive).

Example of ‘squished’ retail
(1809 Emmons Ave., BK)