The Sandy Story:
New York State

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New York State Department of Environmental Conservation
Some Sandy Facts

- Storm was an extra-tropical cyclone. Two storms merged. Their wind and cloud fields expand dramatically.

- Katrina: Winds of 40 mph stretched about 300 miles.

- Sandy: Winds of 40 mph stretched for about 900 miles.

- Katrina created a locally higher storm surge, but Sandy delivered a destructive surge over a larger length of coastline.

- The diameter of Sandy’s tropical storm sustained wind was double the landfall sizes of Isaac and Irene combined.

- 8 Million Without Power
- Airports Inundated
- Subway and Highway Tunnels inundated
- Second most expensive storm in U.S. History
More Sandy Facts

- 147 deaths/ 72 in U.S./ 48 in NY
- Most U.S. direct fatalities from a tropical cyclone, outside of southern states, since Hurricane Agnes in 1972
- Storm surge peaked in between high tide cycles, late Monday afternoon – could have been worse!
- NYC – MTA - $5 billion in damage, 8 tunnels inundated
- NYSE had a 2 day closure – Longest weather related closure since blizzard of 1888
- Bay Park Sewage Treatment Plant in Nassau County overwhelmed by storm surge
- Whole blocks of houses swept away by surge in Staten Island
SANDY
(Frankenstorm)
(Superstorm Sandy)
Declared Disaster Counties - Hurricane Sandy
11/14/2012

Change Log
10/30/2012 - All identified counties identified for individual and public assistance (Part A & Part B)
11/3/2012 - Westchester and Rockland Counties identified for individual and public assistance (Part A & B)
11/10/2012 - Sullivan, Ulster, Orange, and Putnam Counties identified for Individual Assistance,
11/13/2012 - Sullivan, Ulster, Orange, and Putnam Counties identified for public and Individual Assistance,
Governor Cuomo:

“Anyone who says there’s not a dramatic change in weather patterns, I think is denying reality.”

“When you talk about rebuilding, there is certain real estate that Mother Nature owns. She may not visit often, but she owns it, and when she decides to visit, she is going to come and reclaim the property.”
Bowling Green Subway Station – Battery park, NY

Hylan Blvd. – Staten Island NYFD Rescue Search

South Ferry 1 Train Station

Must be a parade today. Why can’t I find an open shoe store!
Westhampton, Long Island (East of Fire Island)
Breezy Point
West end of Rockaways

Fire within Breezy Point, located at the tip of the Rockaways peninsula, destroyed at least 100 homes
NYC Shorelines Where Surge Exceeded BFE plus 2'
Structures Damaged by Sandy

Legend

- All Damaged Structures with CEHA
- Major Damaged Structures within 100 Year Floodplain
- Major Damaged Structures within 500 Year Floodplain
- Major Damaged Structures Outside of Floodplain
### Estimated Damages within FEMA 100 Year Floodplain

<table>
<thead>
<tr>
<th>Location</th>
<th>Estimated Total Number of Damaged Structures</th>
<th>Structures that were Destroyed or Sustained Major Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>14402</td>
<td>5341</td>
</tr>
<tr>
<td>Nassau</td>
<td>18248</td>
<td>4345</td>
</tr>
<tr>
<td>Suffolk</td>
<td>5266</td>
<td>1009</td>
</tr>
<tr>
<td>Westchester</td>
<td>35</td>
<td>0</td>
</tr>
</tbody>
</table>

### Estimated Damages Within FEMA 500 year Floodplain (Outside 100 year Floodplain)

<table>
<thead>
<tr>
<th>Location</th>
<th>Estimated Total Number of Damaged Structures</th>
<th>Structures that were Destroyed or Sustained Major Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>8441</td>
<td>430</td>
</tr>
<tr>
<td>Nassau</td>
<td>819</td>
<td>38</td>
</tr>
<tr>
<td>Suffolk</td>
<td>289</td>
<td>6</td>
</tr>
<tr>
<td>Westchester</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

### Estimated Damages Outside FEMA 100 year and 500 year Floodplains

<table>
<thead>
<tr>
<th>Location</th>
<th>Estimated Total Number of Damaged Structures</th>
<th>Structures that were Destroyed or Sustained Major Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>8593</td>
<td>411</td>
</tr>
<tr>
<td>Nassau</td>
<td>1893</td>
<td>18</td>
</tr>
<tr>
<td>Suffolk</td>
<td>1927</td>
<td>14</td>
</tr>
<tr>
<td>Westchester</td>
<td>89</td>
<td>1</td>
</tr>
</tbody>
</table>

**Only 1/3 of flooded structures had flood insurance**

NYS Department of Environmental Conservation
Breaches across Long Island Shore

Fire Island National Seashore
Brookhaven, LI

Confirmed Breach Locations - 11/01/12

Incident Contact: Colonel Andrew T. Jacob
518-405-5850
atjacob@gw.dec.state.ny.us

Not for Public Release

NYS Department of Environmental Conservation
Breach Closure Policy:

6/2/13: Suffolk County police officers rescued a kayaker who lost his gear, became stranded and was clinging to a pylon after being swept up in a strong current at the Old Inlet breach on Fire Island.
State Response

- Input to State Reports
- Outreach to Local Communities
  - NYC
  - Long Island Municipalities
- Coordinate with FEMA for Community Outreach and Substantial Damage Estimates
• One of Three Reports Commissioned in November, 2012
  – NYS Respond
  – NYS Ready
  – NYS 2100
  • Focus on Resilience and Strength of NYS Infrastructure
NYS 2100 Commission Findings

- Strengthen Building Code
- Targeted Elevations and Buyouts
- Green and Natural Infrastructure
- Incentives for More Sustainable Development
- Wetland and Beach Restoration
- Incorporate Climate Change Mitigation into State Environmental Reviews
What about Giant Sea Walls?

Not Ignored but Uses Cautious Language

- Complexity of NY Harbor
- Cost: $7-29 Billion
- Would not mitigate flooding from rainfall
- May worsen flooding impacts outside of barriers
- Will not protect against Sea Level Rise
- Environmental and Economic Impacts
New York City

• Mayor’s Office and Building Department Highly Engaged
• City Staff Took the Lead
• Substantial Damage Challenges
  – 82,000 Rapid Assessments
    • 756 Red Tags: Unsafe to Enter
    • 7500 Yellow Tags: May be Substantially Damaged
  – Itemized Application for Building Permits over $40,000 (NYC Dep’t of Buildings)
• Dozens of Housing Forums
Advisory BFE Maps

- Only New York City and Westchester
- Rockland County Still to Come (Surge went up Hudson)
- Long Island (Nassau/Suffolk) has Recent Maps
- Coastal Maps already being Developed
  - Data Released as ABFE’s but Data Development was Not Yet Complete
- Good Guidance for Rebuilding but Also Creates some Confusion
Effective FIRM, Staten Island; Existing BFE’s from AE 10 to VE 14
Effective FIRM, Rockaway, Queens
Existing BFE’s from AE 8 to VE 14 (on beach only)
Interior Outside BFE
NYC on ABFE’s

- Did not Adopt
- Exempted Building Height and Yard Restrictions to allow Rebuilding to ABFE’s plus 2’ Freeboard
- Waiting for Preliminary DFIRMs
Long Island Communities

• NYSDEC / FEMA Met with Most Communities
  – Substantial Damage Understanding
  – Offered Assistance
  – Communities More Interested in Mitigation Funding

• Substantial Damage Estimate Help to Five Communities upon Request

• Community Response Mixed:
  – Some get it and are responding
  – Some get it and are overwhelmed
  – Some don’t get it or don’t want to get it
NY Rising

• Housing focus from CDGB Funding
  – Split between NYS and NYC

• HMGP to Focus more on Infrastructure

• [http://nysandyhelp.ny.gov/](http://nysandyhelp.ny.gov/)
Community Reconstruction Zones

- Announced 4/26/13
- Sandy, Irene or Lee
- Local Communities must develop CRZ plans
- Plans lead to Funded Projects
- $397 Million in Planning Grants and Project Funding
CRZ Planning Process

- Inventory of Social, Economic and Natural Resource Assets
- Public Engagement
- Risk Assessment
- Strategies for Investment and Action
- Implementation Schedule
CDBG Grants:
Single Family Housing: $663 Million

- Home Repair to Supplement Flood Insurance or FEMA Grants
- Full Cost of Bringing Substantial Damaged homes to Code
- Buyouts in Highest Risk Areas ($171 Million)
  - 100% of Pre-Storm Value if Within 500 Year Floodplain
  - Enhanced Buy-out: 5%-15% Additional Incentive.
    - 5% If Remain in County or Borough
    - 10% for Targeted Areas
    - Permanent Open Space
- Other Buyouts: Rebuilding to Code Can Occur
CDBG Grants

• Multi-Family Housing: $124 Million
• Business Grants: $415 Million
Challenges: NY’s Local Geography

- **NYC:**
  - One Community
  - 5 Counties

- **Nassau:**
  - 60 Communities

- **Suffolk:**
  - 42 Communities

- “Floodplain Administrator” is local Building or Zoning Official
Challenges: Housing Age in NYS

- Built 1939 or earlier, 2,679,518
- Built 1940 to 1979, 3,755,998
- Built 1980 to 2004, 1,684,288
- Built 2005 or later, 276,598
Challenges: Urban Housing Stock

NYC Housing Types can be grouped into 8 typologies
Reflecting the unique physical character of NYC and its neighborhoods

- Detached 1-2 Family
  - *New Dorp Beach, Staten Island*

- 1-2 family Attached
  - *Greenpoint, Brooklyn*

- Low/Mid-Rise Mixed Use
  - *Red Hook, Brooklyn*

- High-Rise Multi-Family
  - *Sheepshead Bay, Brooklyn*

- Low/Mid-Rise Commercial
  - *Brighton Beach, Brooklyn*

- High-Rise Commercial
  - *Lower Manhattan*

- Low-Rise Industrial
  - *Long Island City, Queens*

- Mid-Rise Industrial
  - *Sunset Park, Brooklyn*

*Thanks to Basilla Yao, NYC Special Initiative for Rebuilding and Resiliency*
Challenges: BW-12, Compliance and Mitigation

• Age of Building Stock and Types of Building lead to Mitigation Challenges
• NYC: Building Resiliency Task Force report
• Suggestions on Actuarial Rating and Incentives for Mitigation
Some Successes

Freeport, Nassau County
Home being Elevated

Compliant New Home in
Staten Island

Slater Blvd., Staten Island
East Rockaway, NY

Thankful Homeowner

- Home Remodeling early 2012 (pre-Sandy)
- Improvements exceeded 50% of home’s value.
- Village enforced substantial improvement requirement
- Owner “begrudgingly” accepted. Elevated to 2’ above Base Flood Elevation
- Neighborhood took on 4’ of water
- Water reached bottom of top step.
- Home was dry; Family was safe
“Because of the great tragedy of Hurricane Sandy, …we have mutually decided that it is an inappropriate time to build a luxury restaurant and banquet facility at Jones Beach.” Donald Trump
Some Coastal Icons Need to Stay Where They Are