A System for Evaluating the Resilience Value of Recovery Projects: The Case of Hurricane Sandy in New York

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Sandy Hits
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• At least 159 people in the United States were killed as either a direct or indirect result of Sandy.

• More than 650,000 homes were damaged or destroyed and hundreds of thousands of businesses were damaged or forced to close at least temporarily.

• $65 Billion in damages and economic loss
resilient [ri-zil-yuhnt] adj.

1. Able to bounce back after change or adversity.
2. Capable of preparing for, responding to, and recovering from difficult conditions.

Syn.: TOUGH
See also: New York City
New York Rising
Community Reconstruction Program
(Formerly known as Community Reconstruction Zones)

Established by Governor Cuomo to provide rebuilding and revitalization assistance to communities severely damaged by Hurricanes Sandy and Irene and Tropical Storm Lee

45 Community plans completed May 2014

Funded by $25 million in Federal CDBG recovery grants

State will complete evaluation for competition funding

State will help communities find additional funding

Total appropriation of $4.4 billion for NY Rising Projects

What is the community reconstruction program?
What is the community reconstruction program?

“As we continue to adjust to the new normal of extreme weather, it is critically important that our communities are as safe and resilient as possible.”

NY Rising is an unprecedented community driven participatory recovery process.
Research Methods

- Collected data by Inventorying all 45 community reconstruction zone plans and over 1400 proposed recovery projects
- Categorized projects that span enormous range on multiple dimensions

Created a System to Measure Resilience Value

- Criteria based on Community Development Block Grant criteria, New York State guidance and academic literature
- Coded and evaluated projects based on consistent criteria
- Helps state and others understand outcomes of planning process
- Assists state and others in deciding which projects to fund by providing comprehensive analysis on multiple dimensions
- Establishes method and framework for evaluating alternative resiliency investments
Resilience or Recovery?

More importantly:

Defines the difference between recovery and resilience.

Evaluates extent to which communities and projects choose one or the other.
Resilience Benefits Criteria

- Climate Change Adaptive Benefits
- Climate Change Mitigation Benefits
- Environmental Benefits
- Economic Cost-Savings Benefits
- Economic Development Benefits
- Vulnerable Populations/Social Justice Benefits
- Health and Human Services Benefits
- Flood Risk Reduction
- Overall Risk Reduction

Each is scored on a scale of LOW, MEDIUM, HIGH and aggregated arithmetically, based on consistent criteria.
Picture of existing shoreline with no bulkheading (left) and rendering of potential bulkheading in this area west of Long Beach Bridge (right).

Source: URS
Frequency of Projects by Term of Impact

**PROJECT TERM**
- Short/Emergency
- Medium
- Long

<table>
<thead>
<tr>
<th>Term</th>
<th>Average Benefits Score</th>
<th>Number of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short/Emergency</td>
<td>10.9</td>
<td>159</td>
</tr>
<tr>
<td>Medium</td>
<td>6.3</td>
<td>995</td>
</tr>
<tr>
<td>Long</td>
<td>6.6</td>
<td>274</td>
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</tbody>
</table>
Distribution by Project Tool

PROJECT MANAGEMENT TOOL FREQUENCY AND BENEFITS

- Fiscal Tools: 26
- Gray Infr & Green Infr: 51
- Education: 52
- Land Use Planning: 118
- Green Infr: 121
- Emergency Planning: 235
- Gray Infr: 332
- Buildings/Structures: 437

AVERAGE BENEFITS SCORE
- Fiscal Tools: 8.9
- Gray Infr & Green Infr: 8.7
- Education: 6.9
- Land Use Planning: 9.9
- Green Infr: 10.3
- Emergency Planning: 7.6
- Gray Infr: 7.0
- Buildings/Structures: 7.3
Costs of Projects

Percentage Distribution of Total Costs

- Buildings/Structures: 22%
- Gray Infra: 25%
- Green Infra, Land Use Planning: 9%
- Land Use Planning: 19%
- Gray Infra, Green Infra: 5%
- Fiscal Tools: 1%
- Education: 2%
- Systemic Resilience (Emergency Planning): 11%
- NA: 2%

Median Costs

- Education
- Fiscal Tools
- Emergency Planning
- NA
- Buildings/Structures
- Land Use Planning
- Gray Infra, Land Use Planning
- Green Infra
- Gray Infra
- Gray Infra, Green Infra
Resilience Benefits by Region

![Bar chart showing resilience benefits by region.](chart.png)

- **Capital Region/North Country/Mohawk Valley**
- **Catskills/Hudson Valley**
- **Long Island**
- **New York City**
- **Southern Tier/Central New York**

Legend:
- Green: Average of Environmental Benefits
- Red: Average of Health and Human Services Performance
- Gray: Average of Economic Development Performance
- Blue: Average of Vulnerable Populations/Social Justice Performance
Did communities choose resilience or recovery?
Both.
The highest resilience scores were for green infrastructure, land use planning, and fiscal tools projects.

The most commonly proposed projects scored lowest on resilience benefits, such as gray infrastructure.

Low cost solutions, such as regulations, could have been better utilized (Only 20 projects out of 840 used legal tools)
Conclusions

Little guidance was given on how to prioritize various benefits – targets could have been included.

More projects should emphasize longer time horizons and climate change adaptation.

Greater emphasis on autonomous and low-cost adaptation.
Conclusions

On balance, New York’s community reconstruction process has the potential to lead the way toward sustainable resilient neighborhoods and cities and provide a model for communities around the world.

Defining and measuring resilience clearly is essential to ensuring more than recovery -- long term, sustainable, just outcomes.
Questions

Is resilience in the eye of the beholder - is it an inherently anthropocentric concept?

Can it only be defined politically? Can we let it be?

How does it differ from sustainability or adaptation?

What is the contribution of urban form/planning to resilience (vs engineering, social factors, economic development, etc.)?
どうもありがとうございました

Thank you for your attention!

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