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FINAL PRESENTATIONS

American Museum of Natural History
New York, NY || January 2026

Reducing Heat Stress in Soundview, Bronx

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Soundview, Bronx Demographics

- One of NYC's most populous neighborhoods at 181,257 residents

- Sociodemographic Makeup:
  - Primarily working class
  - Median Income = $46.5k
  - 26% of residents are under 18

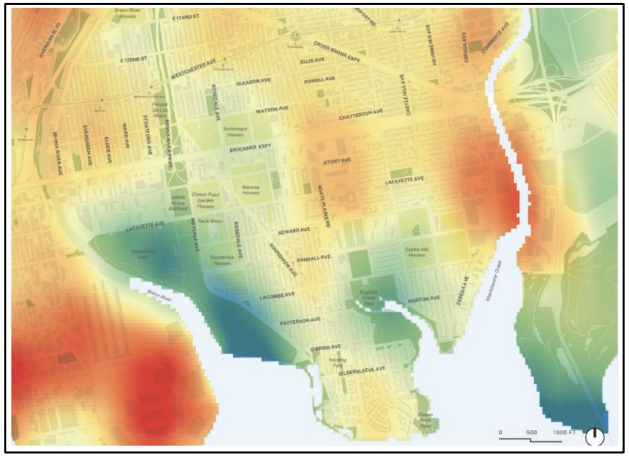
- **Residents highly vulnerable to extreme heat**

- **Many large vacant/underutilized lots on the waterfront**

Images courtesy of Reece Brosco of YMPJ

Problem Statement:

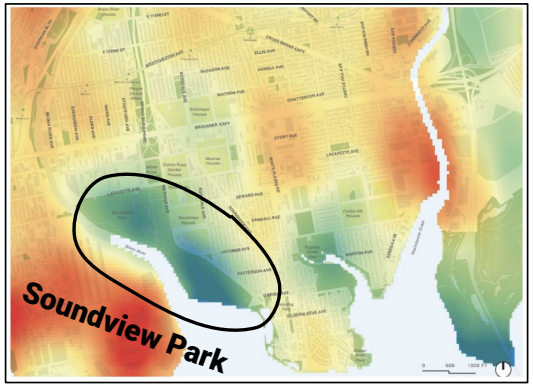
How can we utilize Brownfield development sites in Soundview, Bronx to address heat vulnerability through green interventions?



Problem Context and Solution

Soundview falls within the higher range of Heat Vulnerability Index values*

However, the presence of green spaces can substantially lower local temperatures



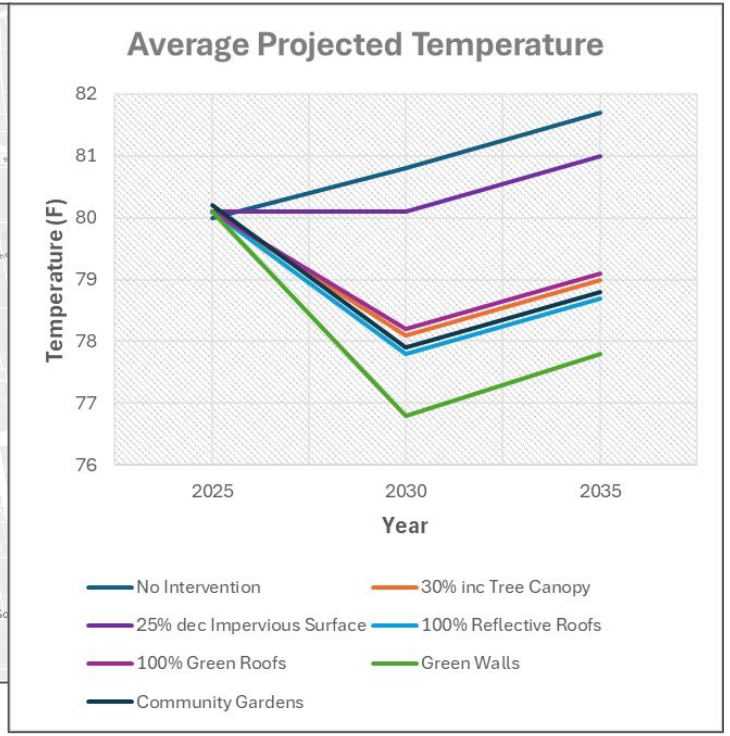
Youth Ministries for Peace and Justice (YMPJ) has identified **49 strategic, underutilized redevelopment sites**

We propose leveraging these sites to mitigate heat risk through **targeted green infrastructure**

* [EJNYC Mapping Tool]

GIS Temperature Projections & Results

[StoryMap]



Data & Tools Used

- **Datasets:**
  - Observational: Google Earth Engine Fine-Grained Surface Temperature, 2025
  - Earth System Model: SSP2-4.5 CESM2 Surface Temperature for 2025, 2030, 2035

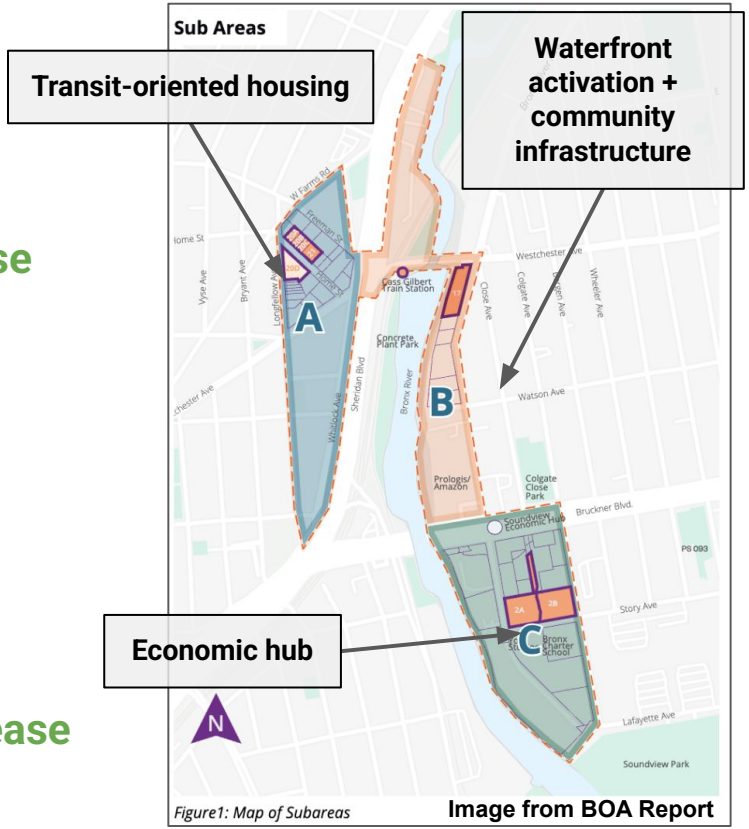
- **Incorporation of Community Feedback:**
  - Youth Ministries for Peace and Justice (YMPJ) Brownfield Site Report
    - Lists 49 potential sites for urban redevelopment

- **Tools:**
  - GIS
  - Environmental Justice NYC Mapping Tool
  - Python

Brownfield Sites & Heat Reduction Strategies

Possible Green Interventions:

- Green walls, 11 studies, average **1.2ºF decrease**
- Community gardens, 6 studies, average **0.9ºF decrease**
- Reflective roofs, expected **0.9ºF decrease**
- 30% Tree canopy coverage, average **0.8ºF decrease**
- Green roofs, expected **0.7ºF decrease**
- 25% reduction in paved surfaces, average **0.2ºF decrease**



Project Assumptions

- Projections focus on average summer conditions (June – August) for 2030 and 2035
- Temperature values are obtained through preliminary estimates using naive calculations
- Uncertainties and error in estimates are not quantified (yet)

Ways to expand our project

- Precisely quantify the effects of green interventions on lowering local temperatures
- Include more rigorous metrics to measure projection error and significance (RMSE, NSE, p-values)
- Refine GIS Web App with future expansions while improving accessibility for policy makers and community leaders
- Continue evaluating possible data sources, with a focus on either air or surface temperature
- Develop a model to produce high-resolution temperature projections

Sources

Online Resources:

1. YMPJ BOA Report
2. EJNYC Mapping Tool
3. Google Earth Engine LST Data
4. CESM2 Data
5. Neighborhood Factors
6. Surface Air Temp Differences
7. LST relationship looseness and temperature differences
8. GUHI to SUHI temperature differences
9. Average Air Temperature in Central Park
10. Tree Canopy effect on temperature
11. Impervious Space effect on temperature study 1
12. Impervious Space effect on temperature study 2
13. NYC 2025 Monthly Air Temperatures

Sources cont.

Online Resources:

14. Reflective Roofs effect on temperature study 1
15. Reflective Roofs effect on temperature study 2
16. Reflective Roofs effect on temperature study 3
17. Green Roofs effect on temperature study 1
18. Green Roofs effect on temperature study 2
19. Green walls effect on temperature
20. Community gardens effect on temperature
21. NYC Street Design Manual
22. NYC Stormwater Manual
23. NYC Local Law 92 and 94

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