



Climate Safe Neighborhoods

A Project by Groundwork Hudson Valley
Yonkers, NY

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Groundwork Hudson Valley creates sustainable environmental change in urban neighborhoods through community-based partnerships that promote equity, youth leadership, and economic opportunity.

Sustainability Education



Youth Leadership



Transforming Places

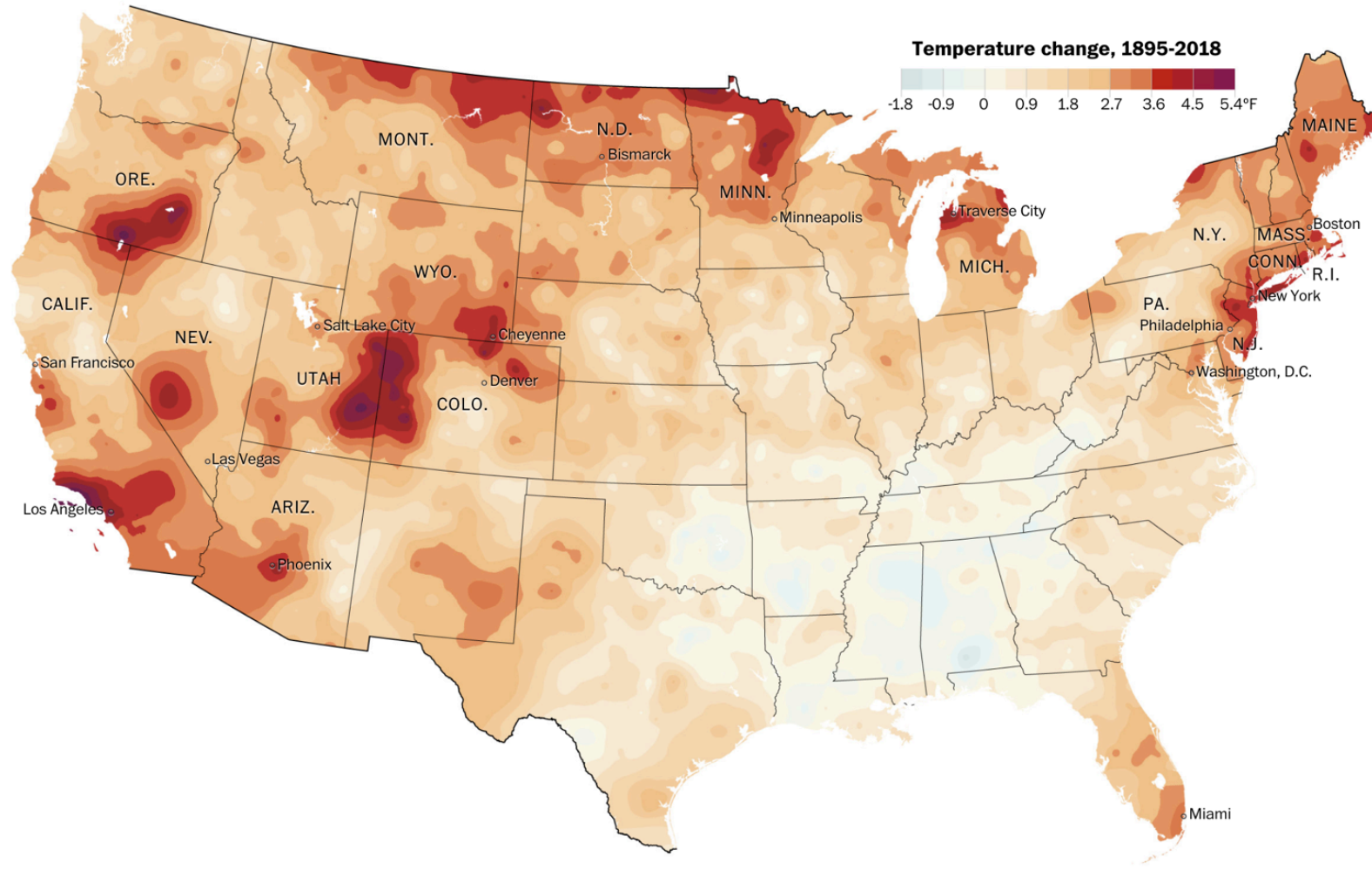


CLIMATE SAFE NEIGHBORHOODS



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It's Getting Hot In Here!

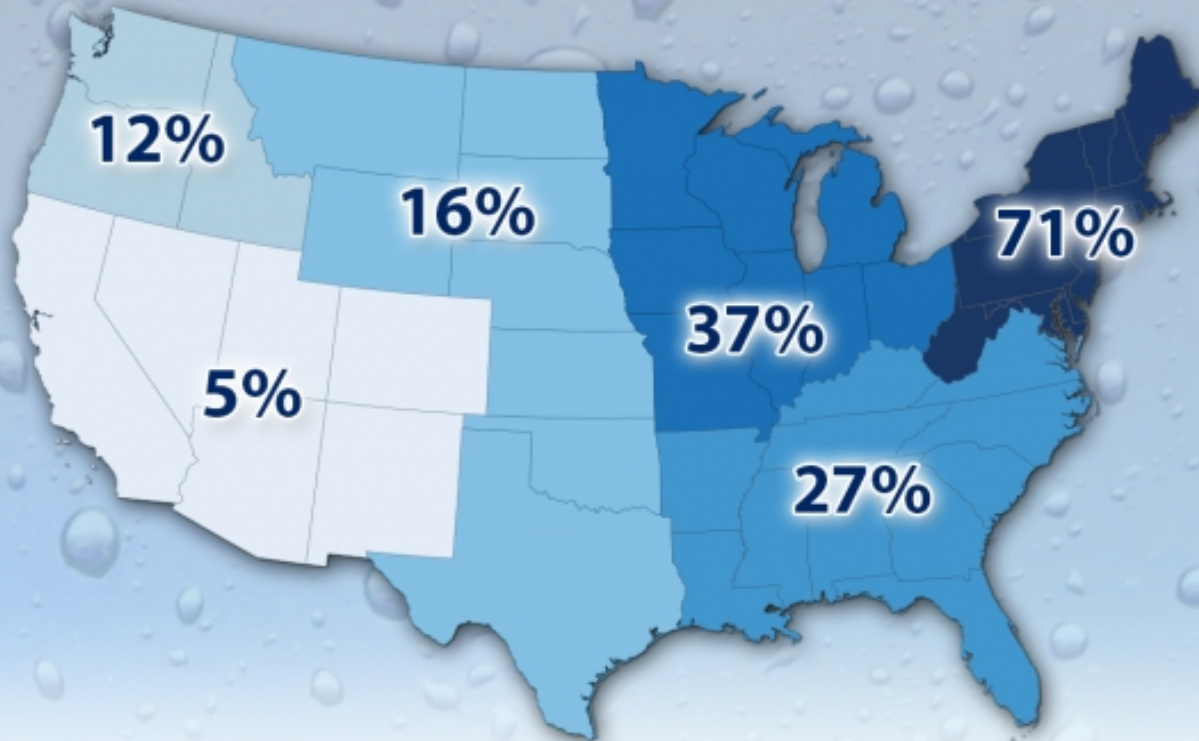


Source: Washington Post:
<https://www.washingtonpost.com/graphics/2019/national/climate-environment/climate-change-america/>

Note: NOAA does not provide data for Alaska or Hawaii for this time period.

And wet...

Heavy Downpours Increasing



Percent increase from 1958 to 2012 in the amount of precipitation falling in very heavy events.

Very Heavy Precipitation is defined as the heaviest 1% of all daily events from 1958-2012.

Source: Kenneth Kunkel, Cooperative Institute for Climate and Satellites, North Carolina State University and NOAA NCDC

CLIMATE CO



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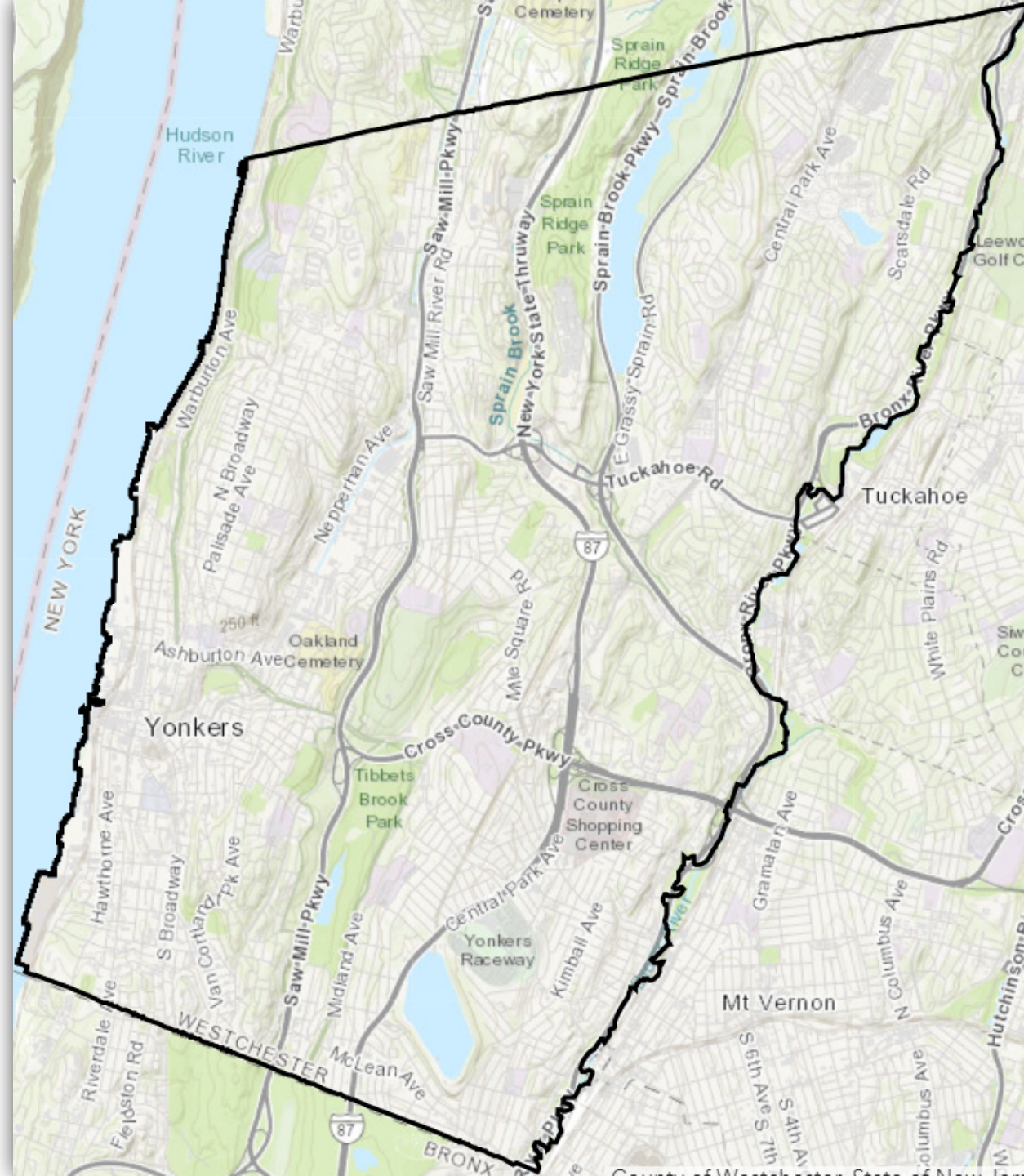
Climate Safe Neighborhoods

- 9 Groundwork Trusts and GWUSA
- Map heat and flooding
- Examine historical systematic causes
- Identify Vulnerable Communities
- Community intervention in local systems

- Thank you to our funders and partners:

- *Community Groups*
- *DEC Office of Environmental Justice*
- *The JPB Foundation*
- *The Kresge Foundation*
- *The City of Yonkers*
- *CAPA Strategies*
- *NOAA*
- *The New School Urban Systems Lab*
- *Sarah Lawrence College*
- *Municipal Housing Authority for The City of Yonkers*
- *Westhab*
- *Westchester County*
- *NASA Develop*
- *NY Sea Grant*





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CHANGING PLACES
CHANGING LIVES

Heat Vulnerability Index (HVI)

Exposure Measure

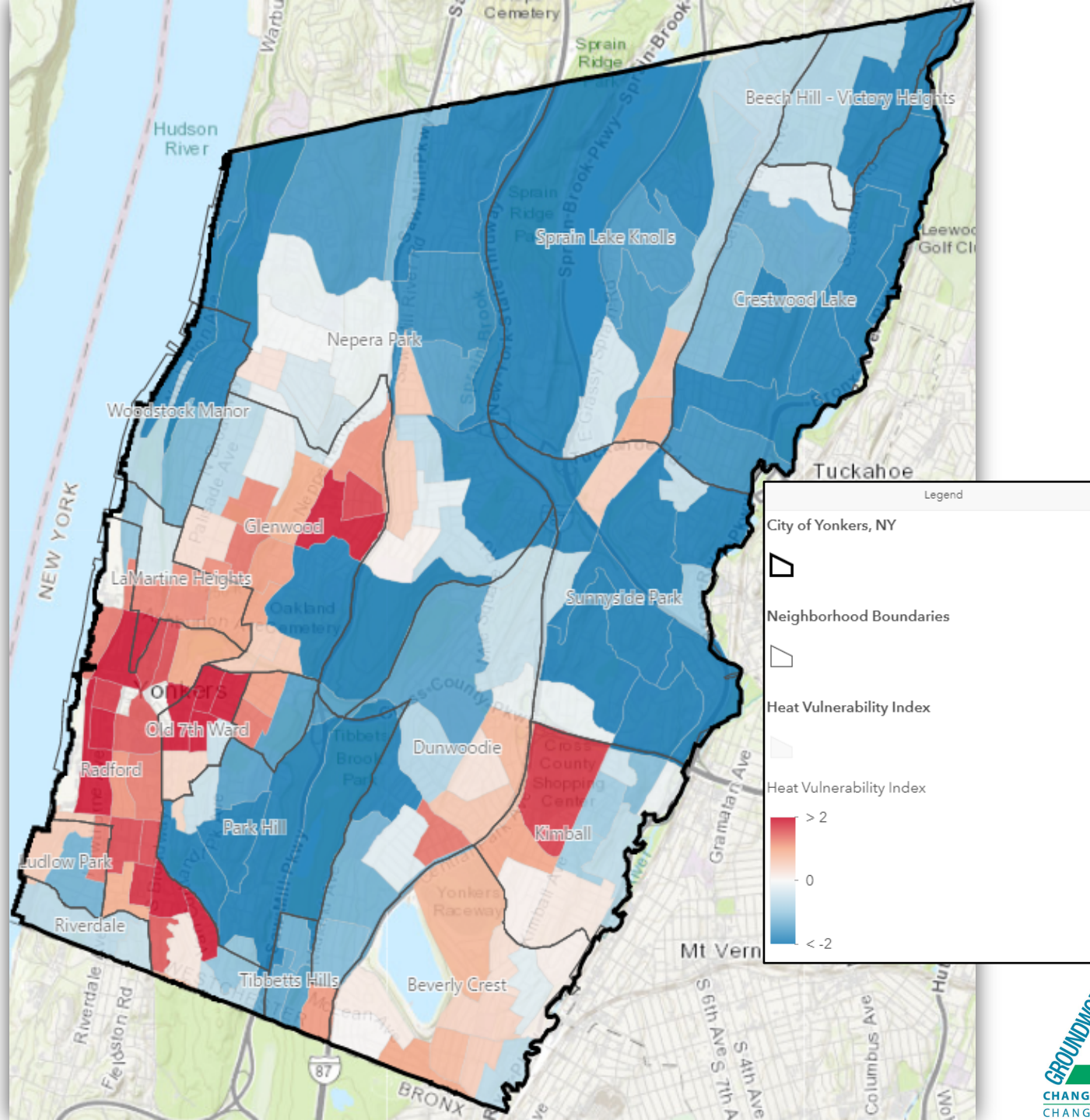
- Land Surface Temperature

Sensitivity Measures

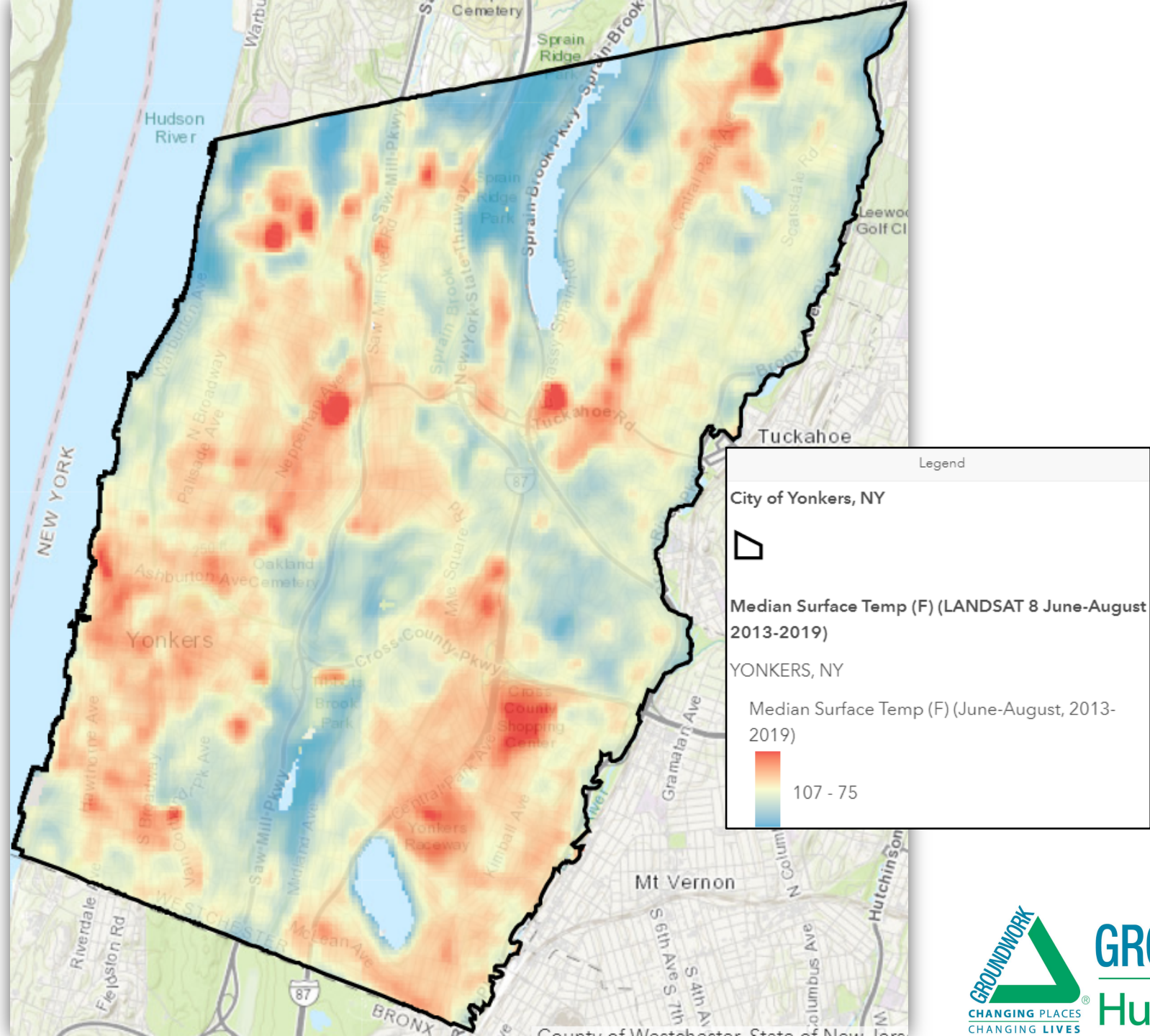
- Impervious Surface
- Tree Canopy

Adaptive Capacity Measure

- Percent Household in Poverty



- Satellite based median surface summer temp
- Major anomalies
- Southwest Yonkers
- Corridors – roads
- Hotspots- parking lots, large buildings



Heat Vulnerability Index (HVI)

Exposure Measure

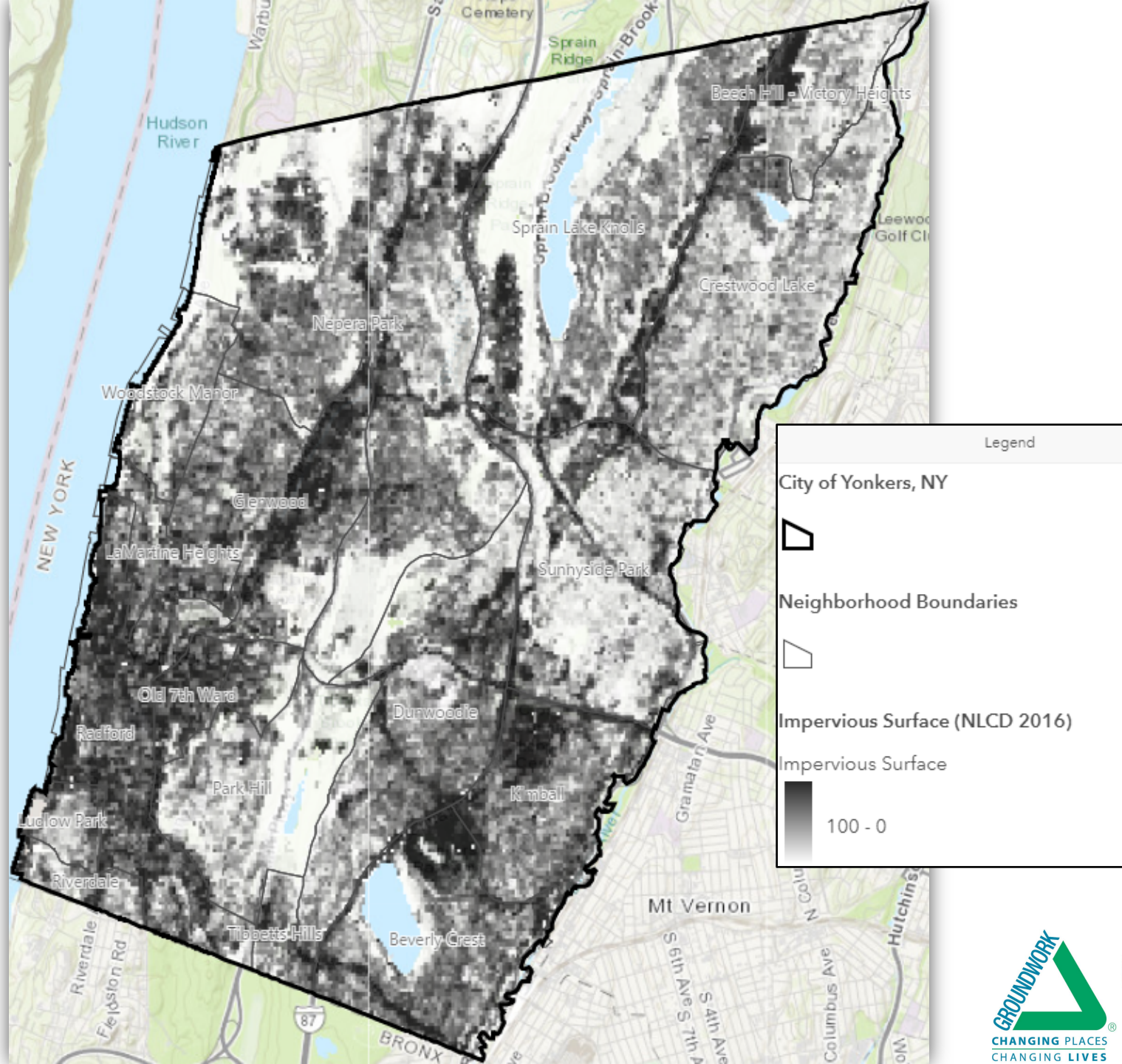
- Land Surface Temperature

Sensitivity Measures

- **Impervious Surface**
- Tree Canopy

Adaptive Capacity Measure

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Heat Vulnerability Index (HVI)

Exposure Measure

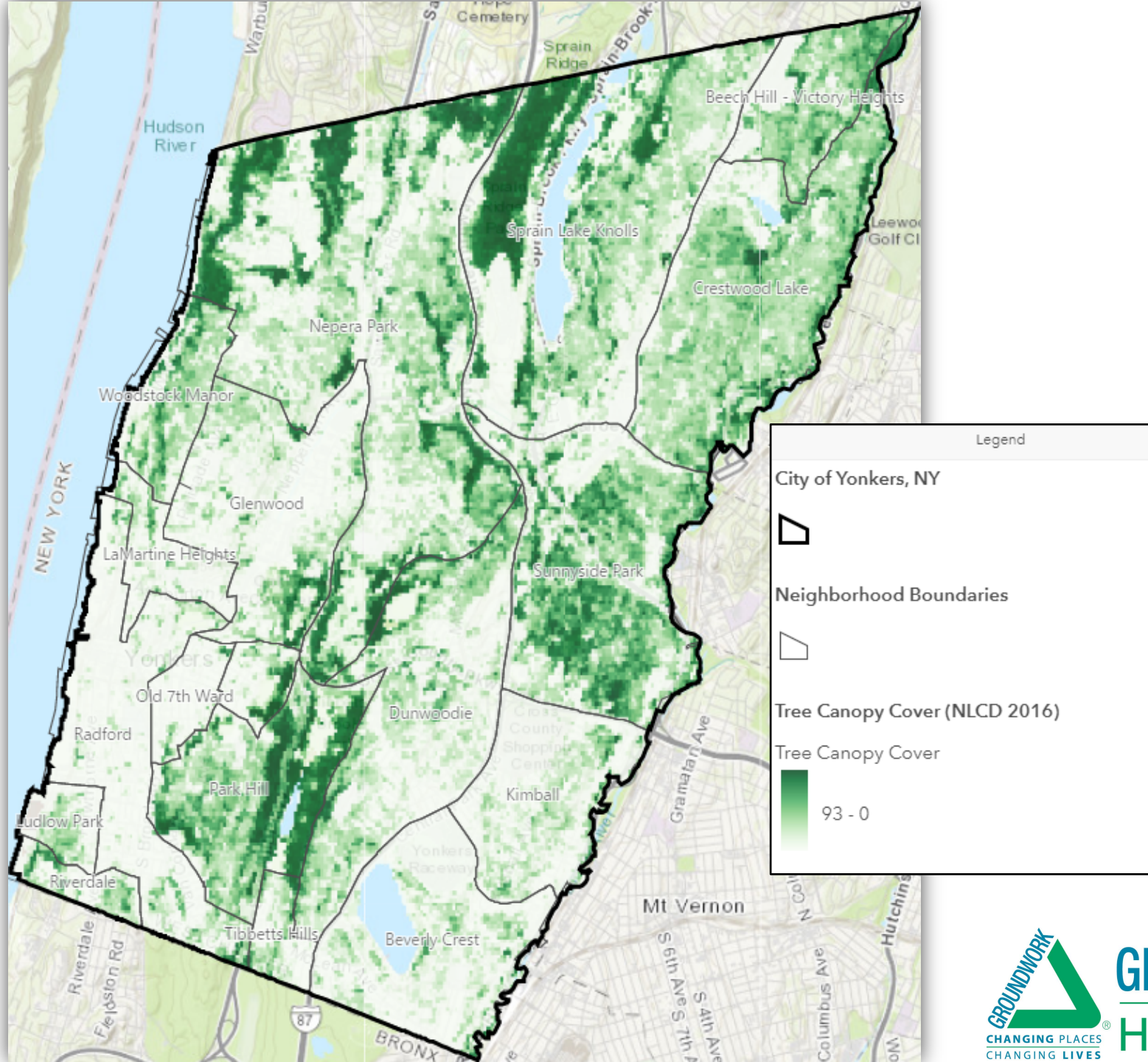
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Sensitivity Measures

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- **Tree Canopy**

Adaptive Capacity Measure

- Percent Household in Poverty

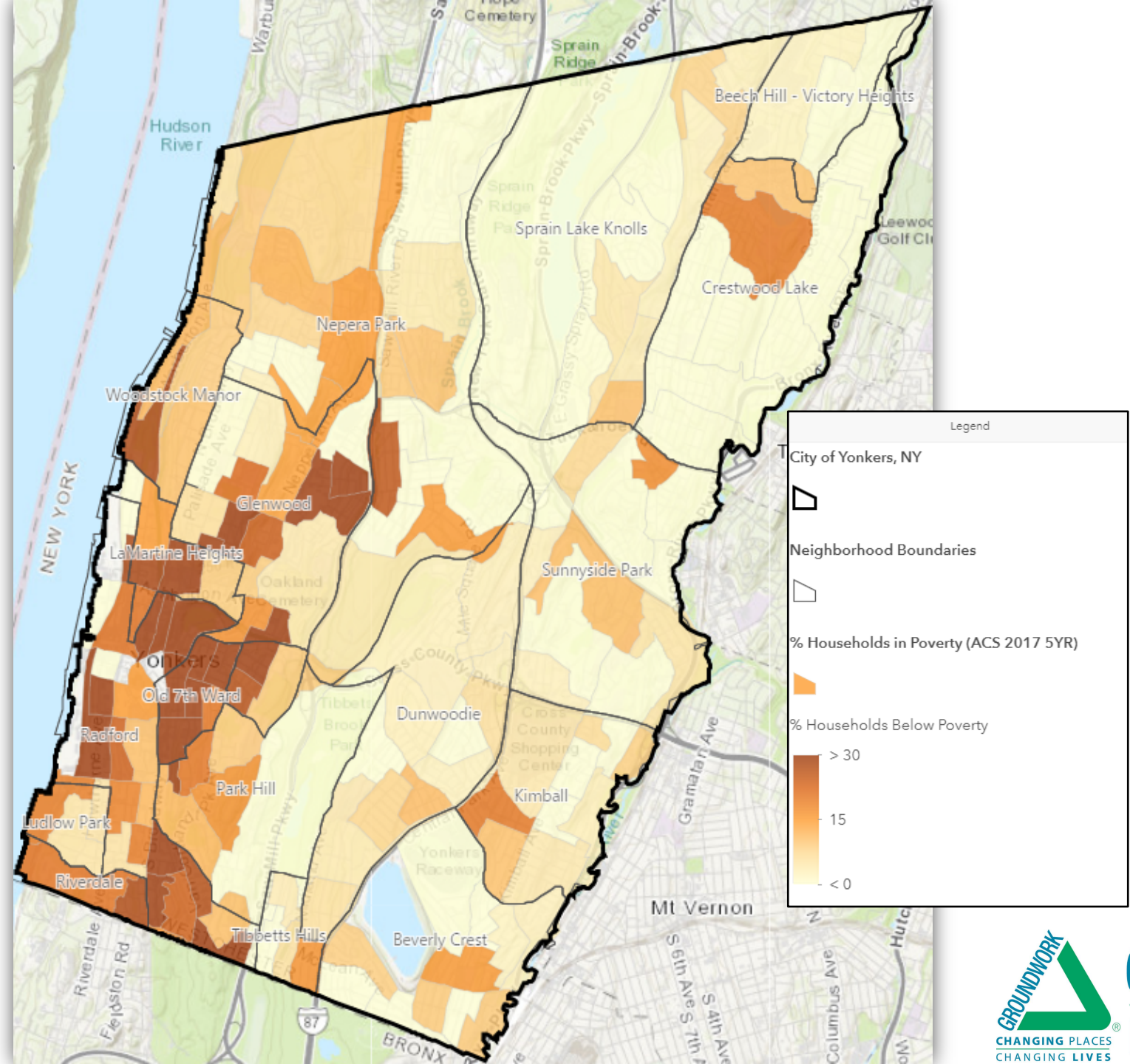


Heat Vulnerability Index
(HVI)

- Exposure Measure
- Land Surface Temperature

- Sensitivity Measures
- Impervious Surface
 - Tree Canopy

- Adaptive Capacity Measure
- Percent Household in Poverty



Heat Vulnerability Index
(HVI)

Exposure Measure

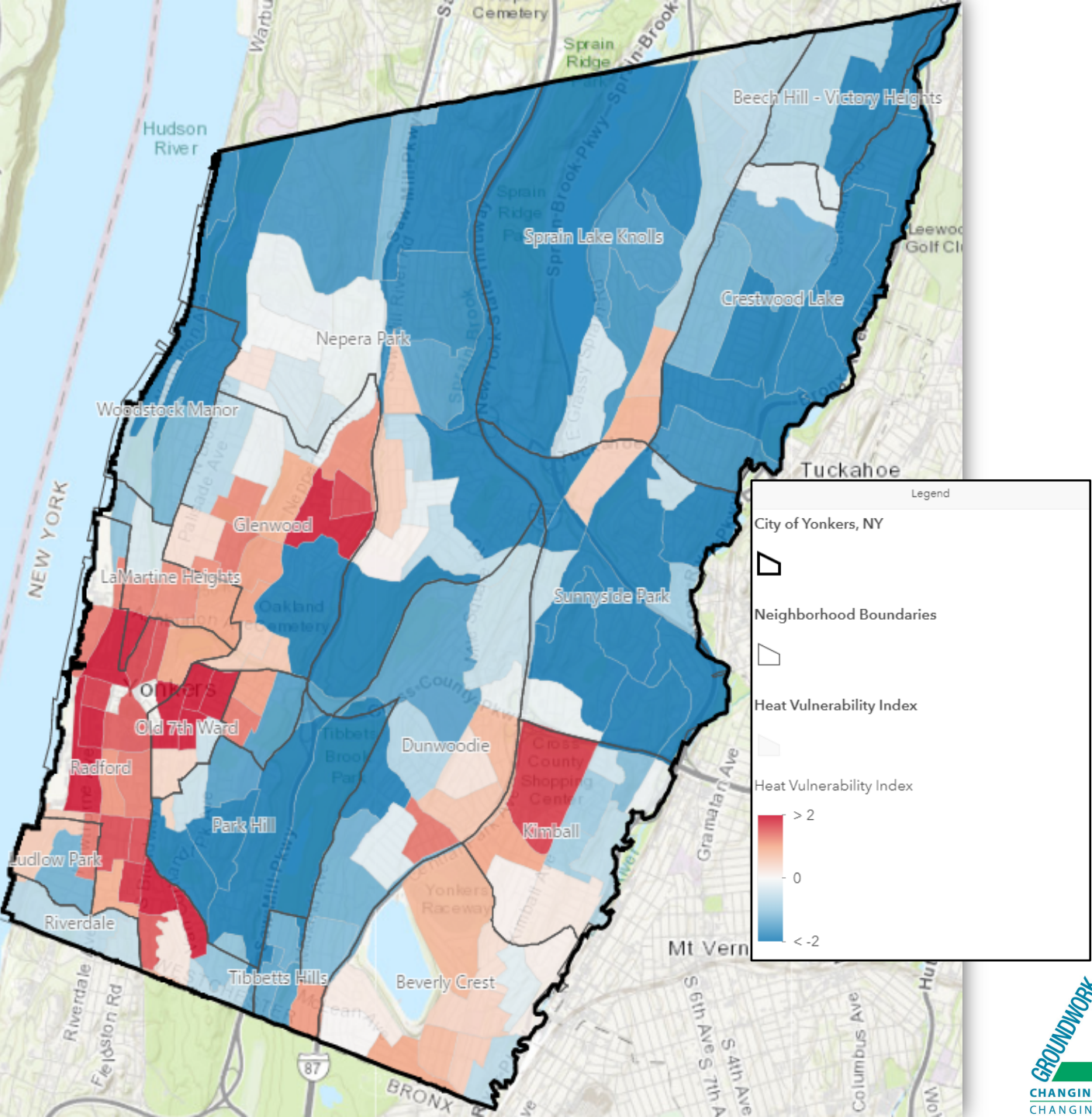
- Land Surface Temperature

Sensitivity Measures

- Impervious Surface
- Tree Canopy

Adaptive Capacity Measure

- Percent Household in Poverty



Scripts

Docs

Assets

NEW

↺

Owner (3)

users/gwmke/NLCD

LST

FLNT_LST_13_19

HV_LST_13_16

HV_LST_13_19

HV_LST_17_19

HV_LST_L7

HV_LST_L7_1999_2010

HV_LST_L7_2011-2015

LSTcalc

LogE

HV_LST_13_19

Get Link

Save

Run

Reset

Apps

⚙️

```

127 Map.addLayer(EM, vizParamsEM, 'EM');
128
129 // Land Surface Temperature
130 // LST = (BT / (1 + (0.00115 * BT / 1.4388) * Ln(ε)))
131 // LST c,d,f, p1, p2, p3 are assigned variables to write equation easily
132 var c = ee.Number(1);
133 var d = ee.Number(0.00115);
134 var f = ee.Number(1.4388);
135
136 var p1 = (thermal.multiply(d)).divide(f);
137 print('p1', p1);
138 //Map.addLayer(p1, vizParamsThermal, 'p1');
139 var p2 = EM.log();
140 print('p2', p2);
141 //Map.addLayer(p2, vizParamsEM, 'p2');
142 var n3 = (n1.multiply(n2)).add(c);

```

Inspector

Console

Tasks

Use print(...) to write to this console.

spatialFilter

ImageCollection LANDSAT/LC08/C01/T1_TOA (554 elements)

JSON

sum19

ImageCollection LANDSAT/LC08/C01/T1_TOA (22 elements)

JSON

sum18

ImageCollection LANDSAT/LC08/C01/T1_TOA (21 elements)

JSON

sum17

JSON

📍

📏

📐

📄

📁

Geometry Imports

+

-

Erie

Youngstown

Pittsburgh

Morgantown

Harrisburg

Hershey

Lancaster

York

Scranton

Ithaca

Albany

Boston

Providence

PENNSYLVANIA

MARYLAND

MASSACHUSETTS

RHODE ISLAND

Layers

Map

Satellite

Man data ©2020 Google

50 km

Terms of Use

Heat Vulnerability Index

$$2 \left(\frac{i - \min}{\max - \min} \right) - 1$$

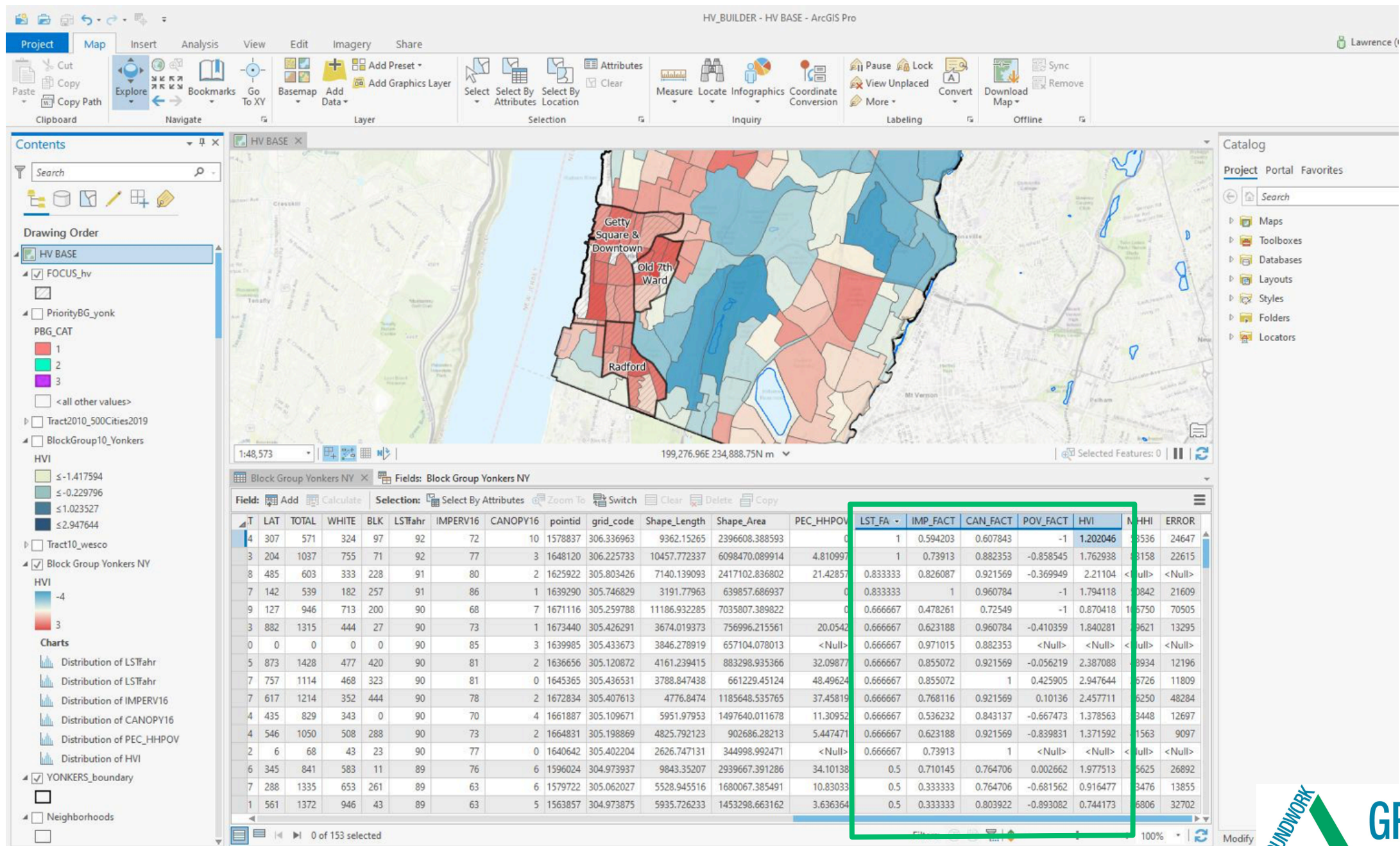
Where:

i = attribute value for individual block group

\max = maximum value of range

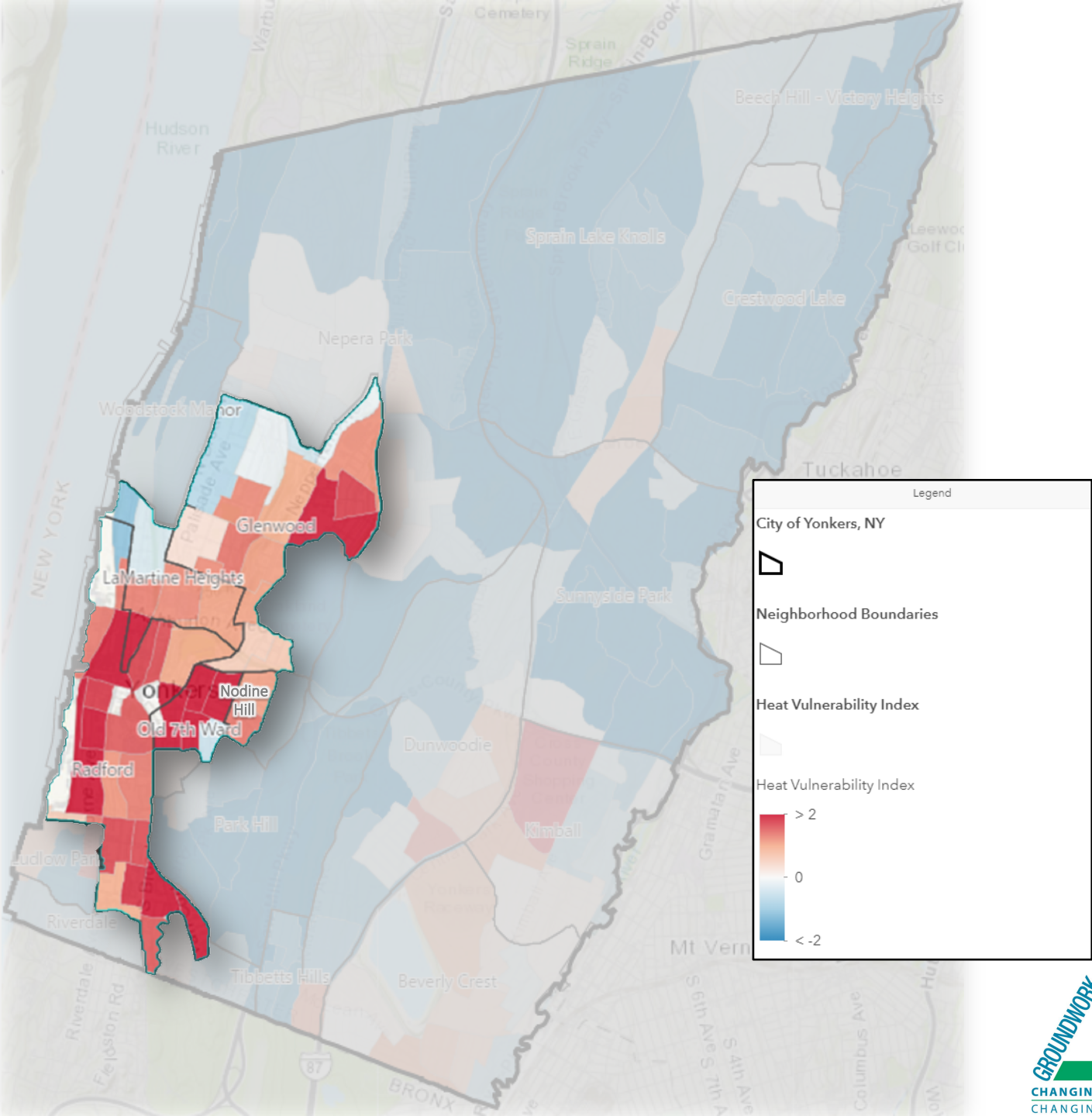
\min = minimum value of range

Note: Factor scaling for Tree Canopy requires multiplying the result of this equation by -1 since the absence of canopy increases vulnerability to heat. Whereas, for the other three variables in the index, their presence leads to greater heat vulnerability.



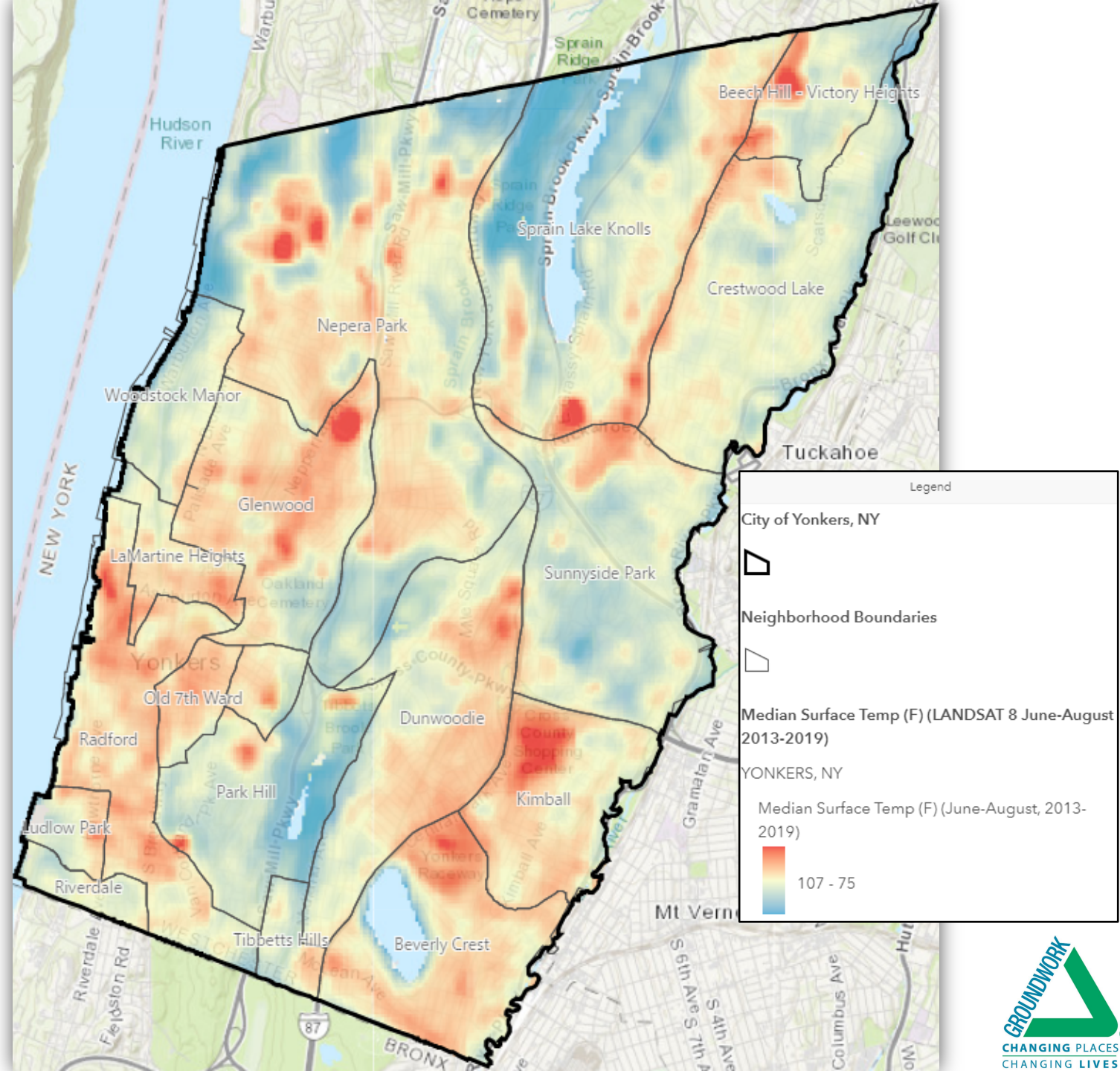
5 Priority Neighborhoods

- Glenwood
- LaMartine Heights
- Radford
- Old 7th ward
- Nodine Hill



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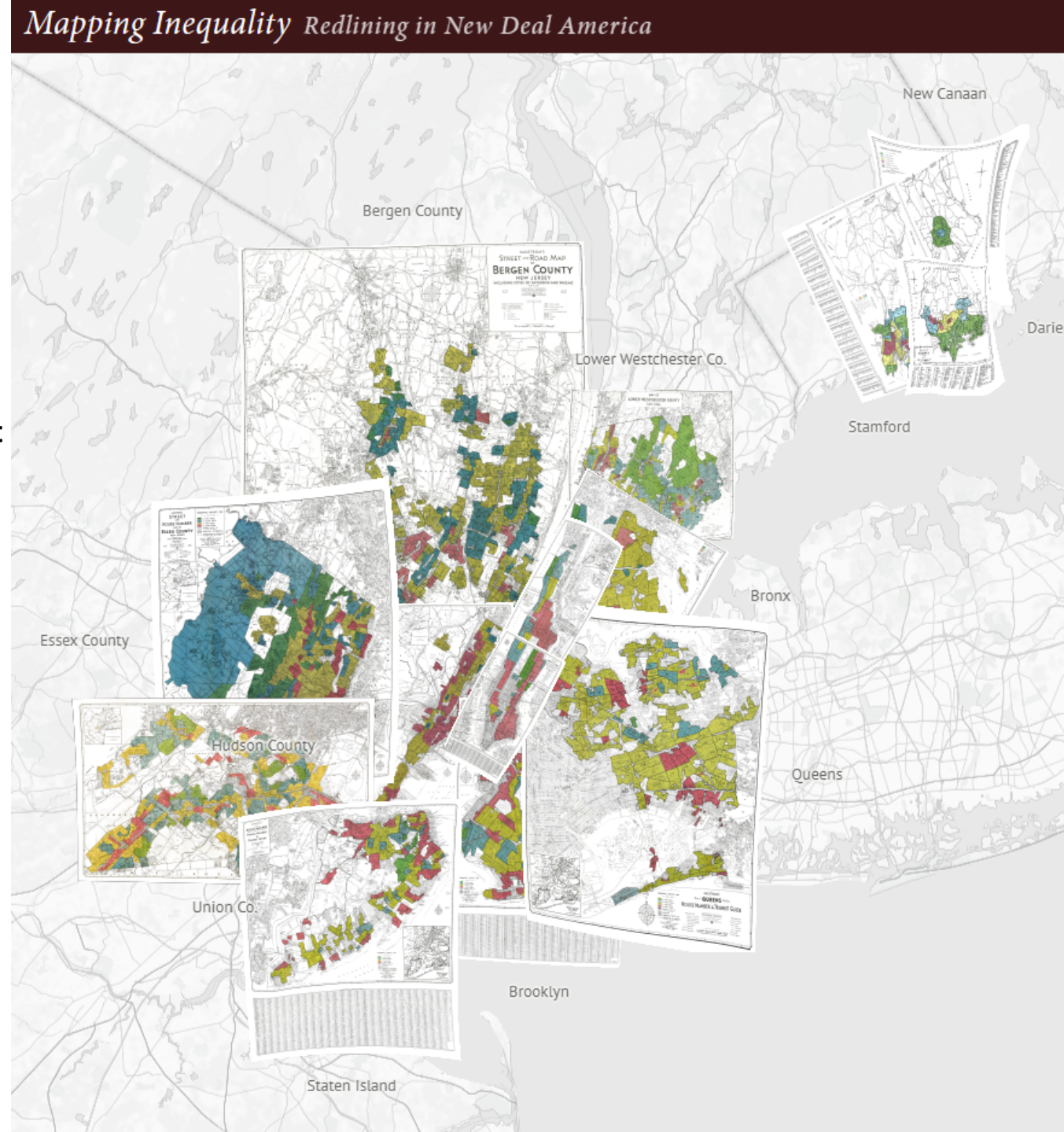
Why are some neighborhoods hotter than others?



Redlining

Commissioned by the Federal Government

- **Federally Backed Mortgages**
Policy to make lending easier and safer and promote wealth building.
- **Can't Buy, Can't Sell, Can't Leave**
Maintains pre-1917 segregation, current owners can't sell, POC can't buy in other neighborhoods.
- **Financial Disincentives to Invest in Neighborhoods**
Sewage, water, housing stock, parks.



Mapping Inequality

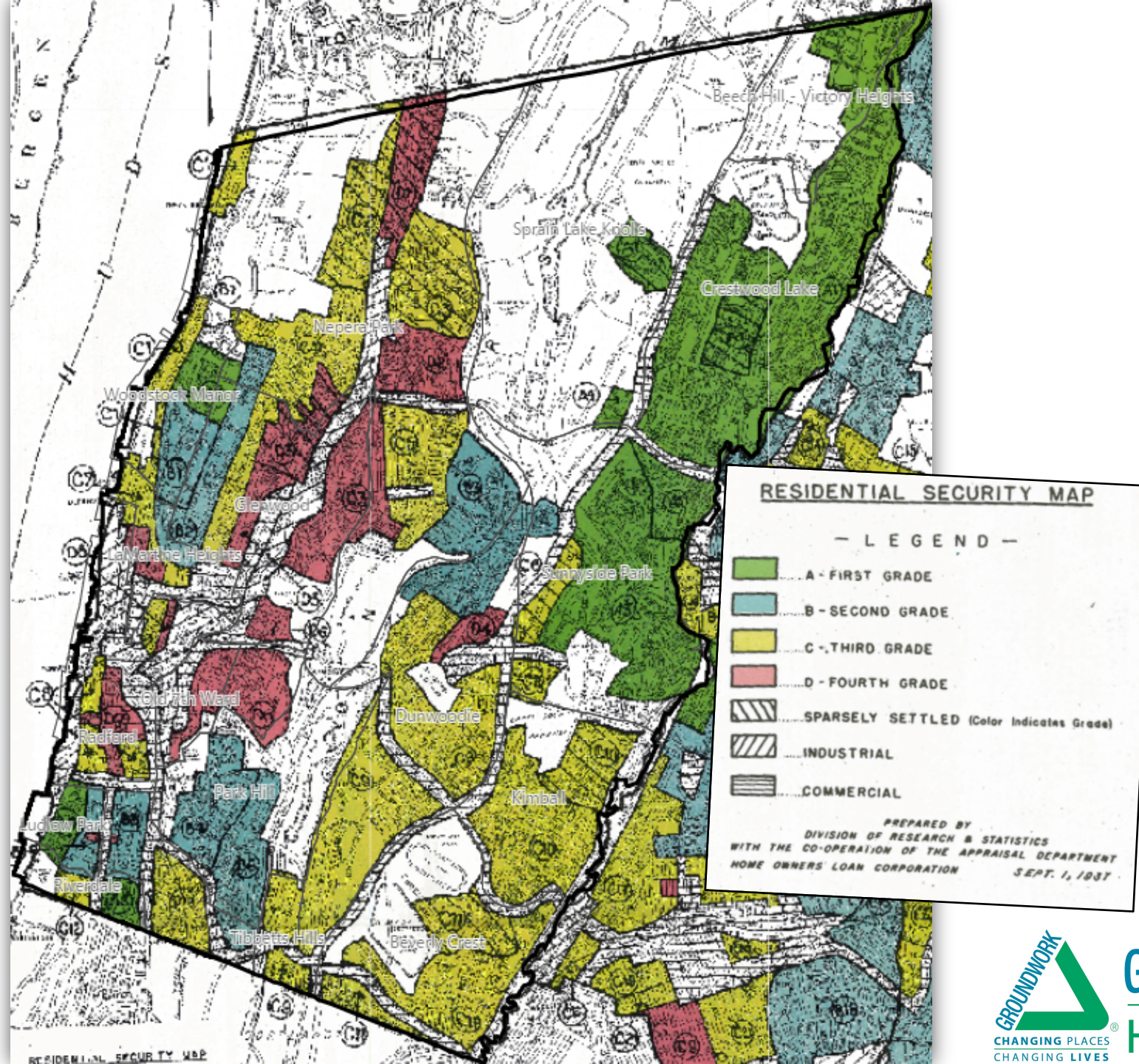
Online collection of HOLC documents

Green = A= First Grade
(white, good housings
stock)

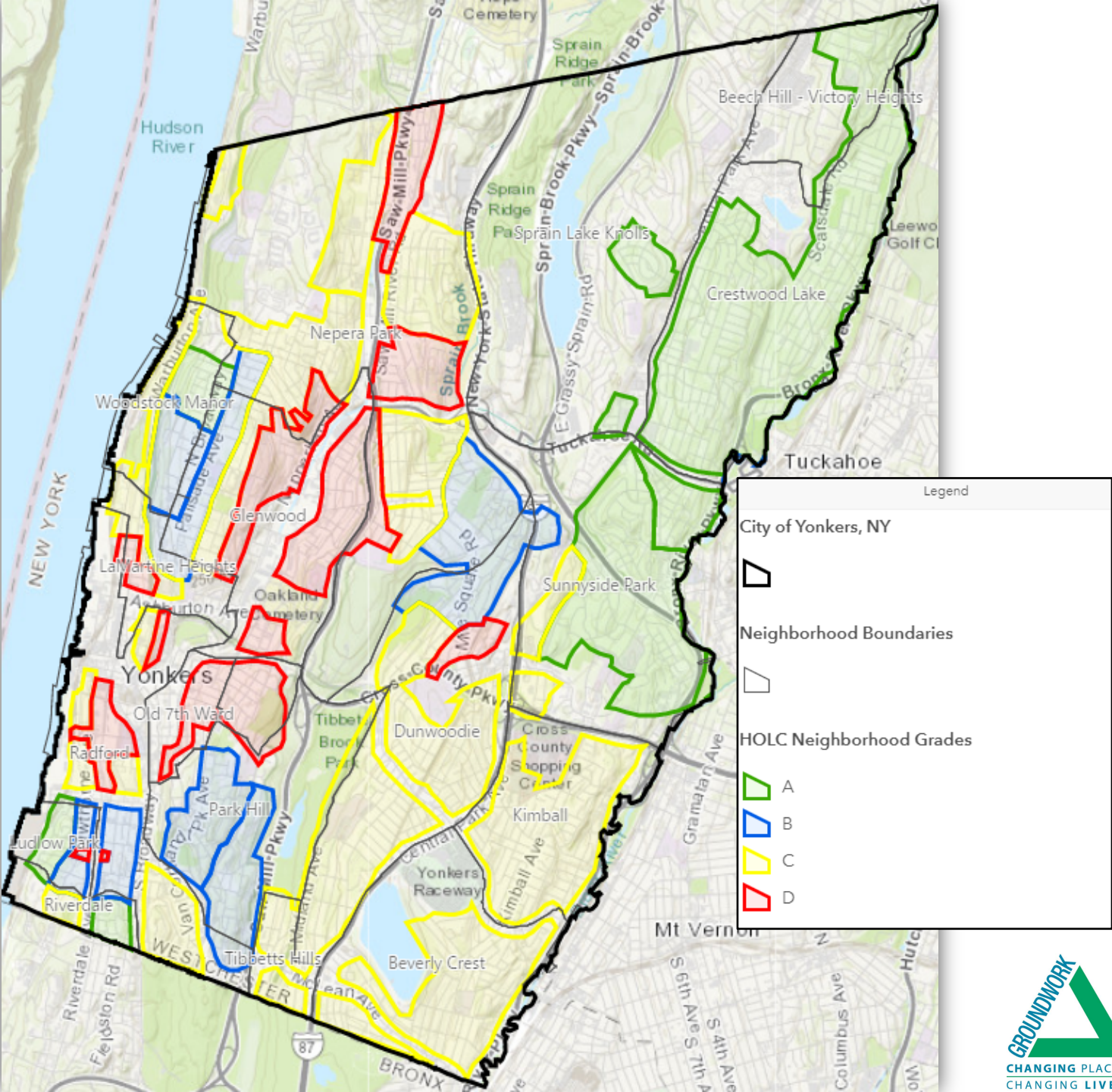
Blue= B= Second Grade
(white-ish, ok housing
stock)

Yellow = C= Third Grade
(might be white now, poor
housing stock, immigrants,
mixed race)

Red=D= Fourth Grade
(POC, poor housing stock)

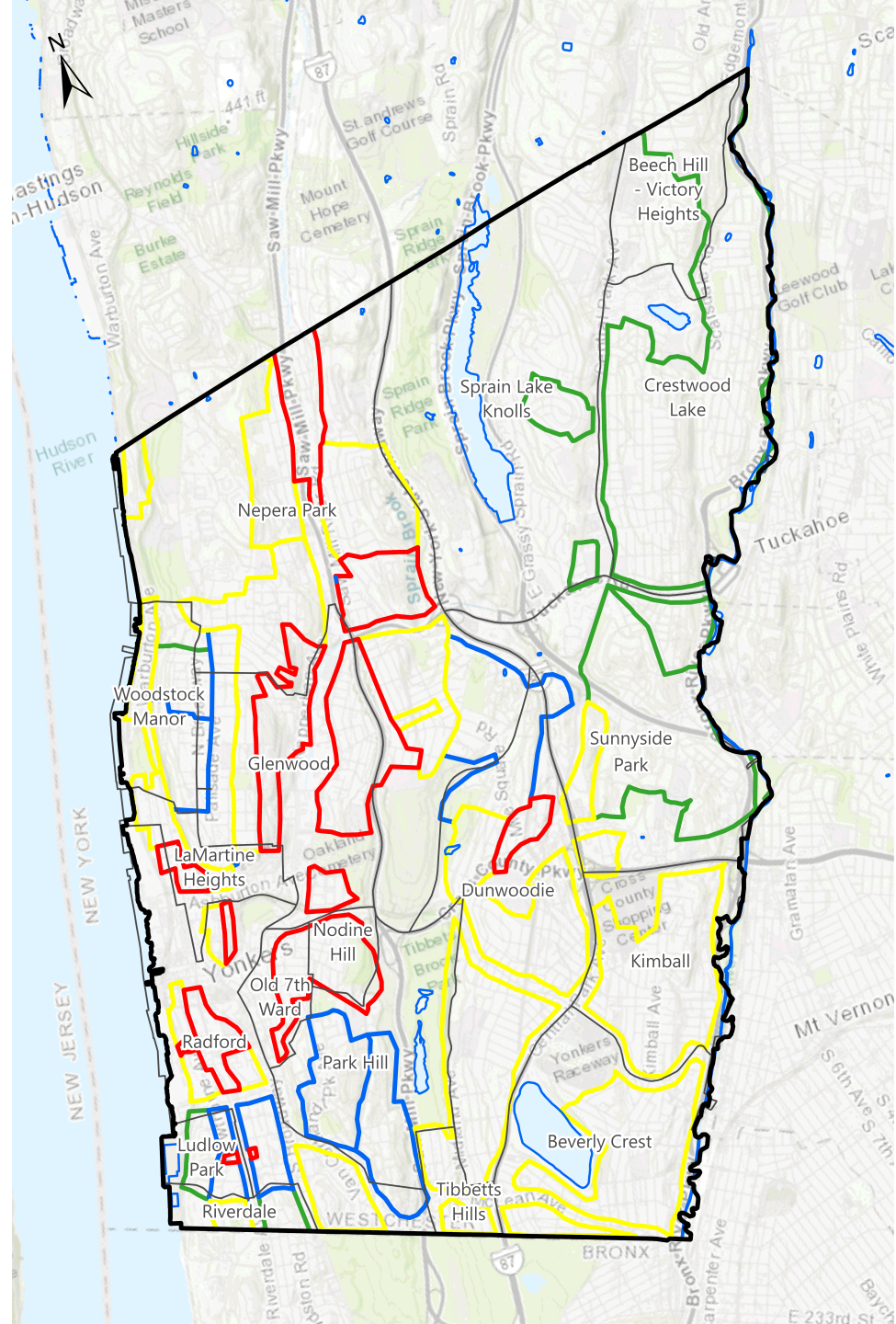


Digitizing HOLC Map



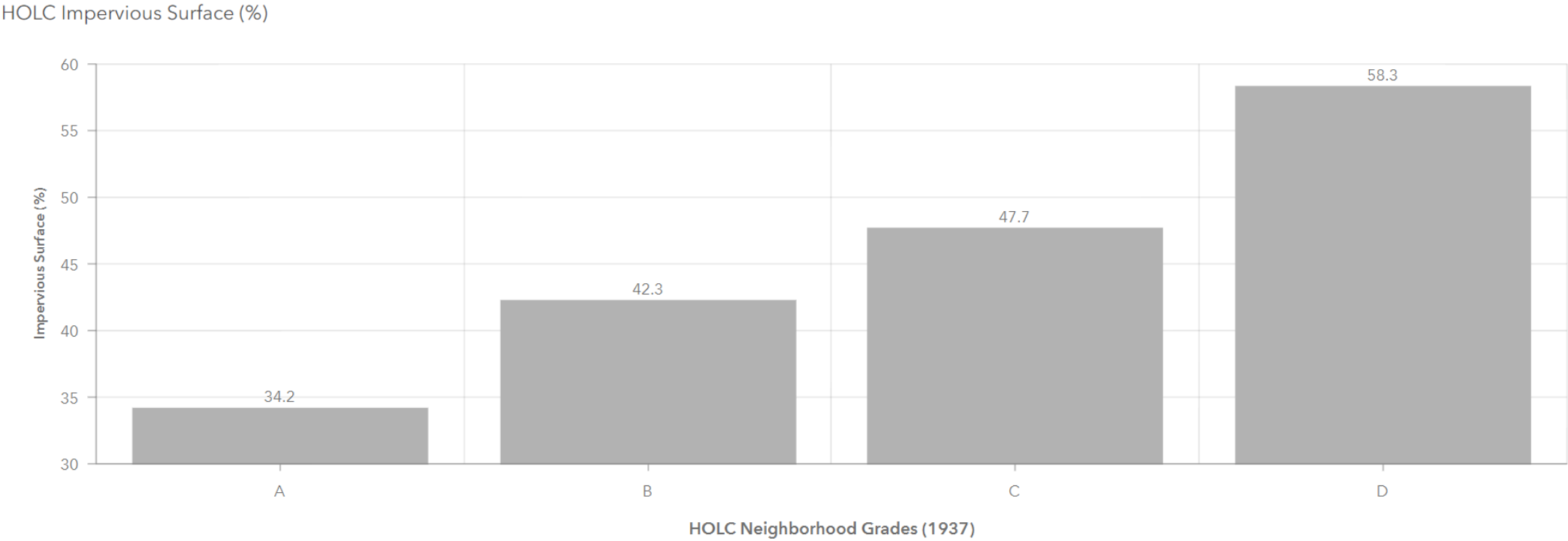
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**Exposing the relationship
between historic
discriminatory federal policy
and current day
environmental inequity**

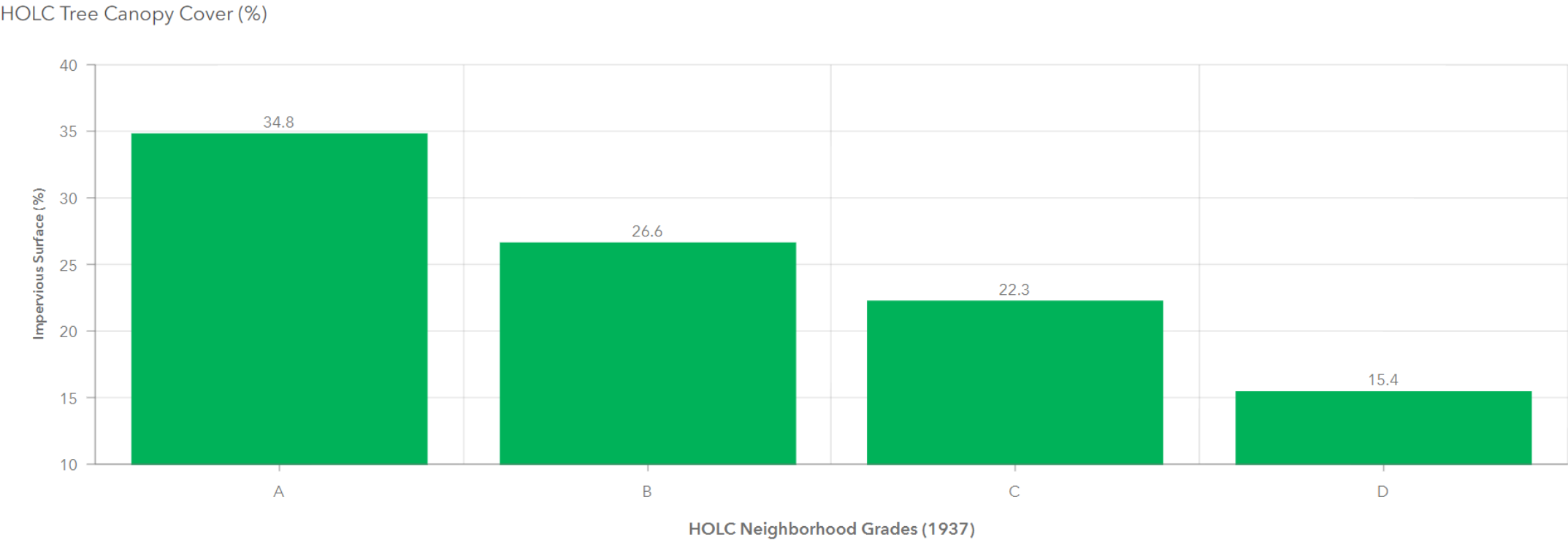


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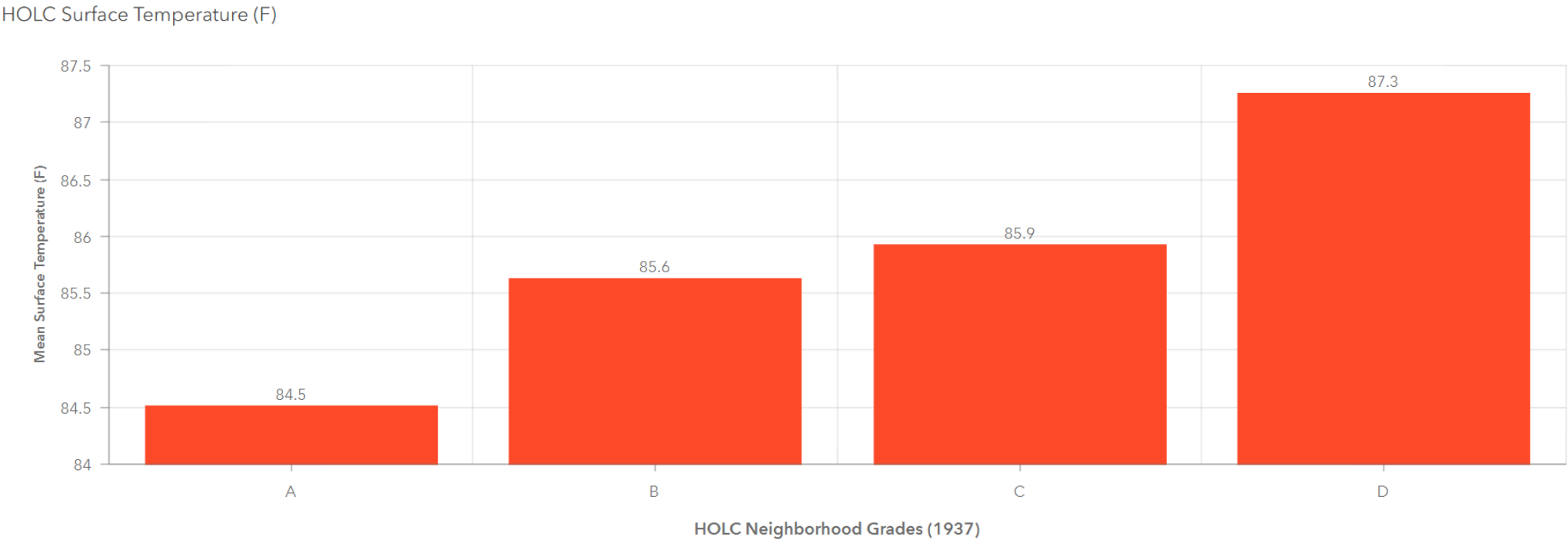
Exposing the relationship between historic
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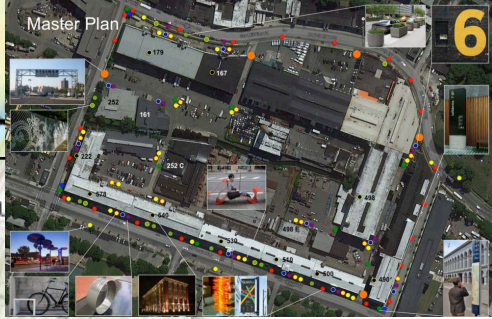
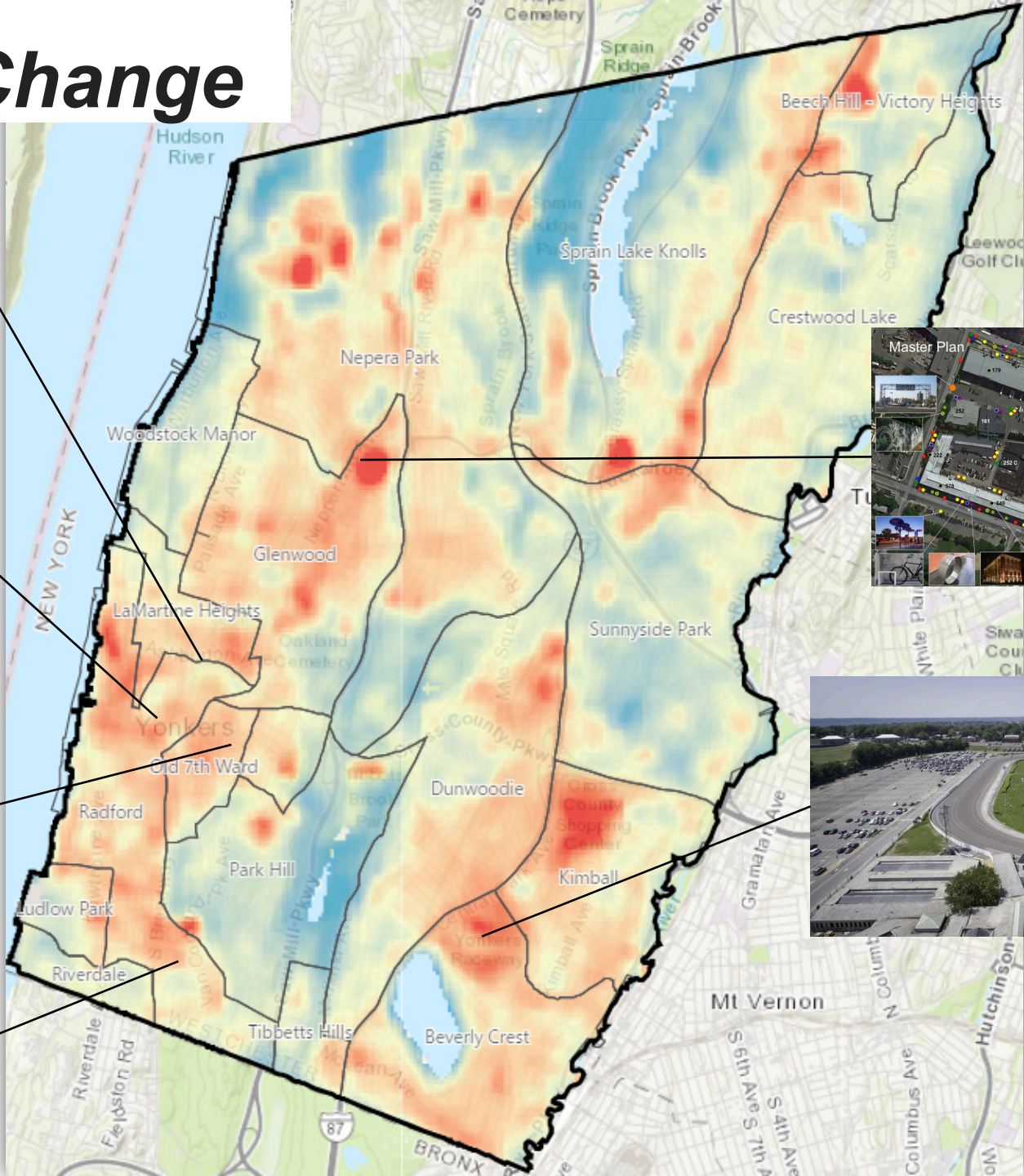
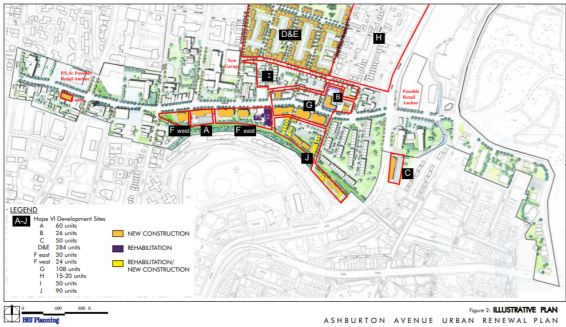


Yonkers Climate Resiliency Task Force

- **Identify**
 - Hazards
 - Vulnerabilities
 - Assets
 - Opportunities
- **Prioritize**
 - Needs
 - Mitigation Strategies
 - Locations
 - Design
- **Organize for Change**
 - Local projects
 - Resiliency Community Networks
 - City Priorities and Vision
 - Stewardship



Vehicles of Change



Local Interventions

Street Trees Planting



Human-made Shade



Cooling Centers



Rain Gardens



Reflective Roofs



Green Roofs



Thank You!



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