Planning for Climate-Smart Cities

GREEN INFRASTRUCTURE FOR COASTAL PROTECTION

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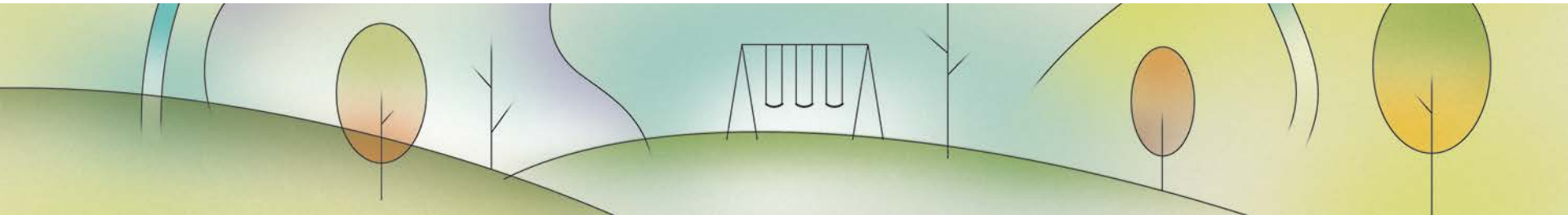

Overview of Presentation

- TPL Leadership in GIS & Planning Applications
- Overview of Climate-Smart Cities
- Green Infrastructure for Coastal Resilience Pilot

TPL Leadership in GIS & Planning Applications

- TPL has developed custom JavaScript to build decision support tools on the Esri platform
- 2006 Esri *Special Achievement in GIS Award*
- 2012 Esri *Making a Difference Award*

TPL's Integrated Services

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Climate-Smart Cities Can Lead Global Carbon Diet

NYC vs. Suburbs

13,448 Lbs. Less CO2 Per Capita

The Greenness of Cities: Carbon Dioxide Emissions and Urban Development, Glaeser and Kahn, 2008

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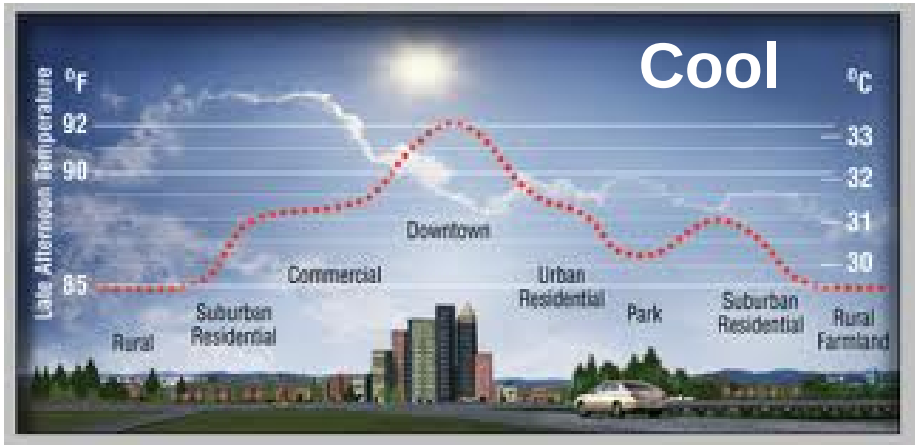
Climate-Smart Cities = Safety & Environmental Justice

Green Infrastructure for Climate-Smart Cities



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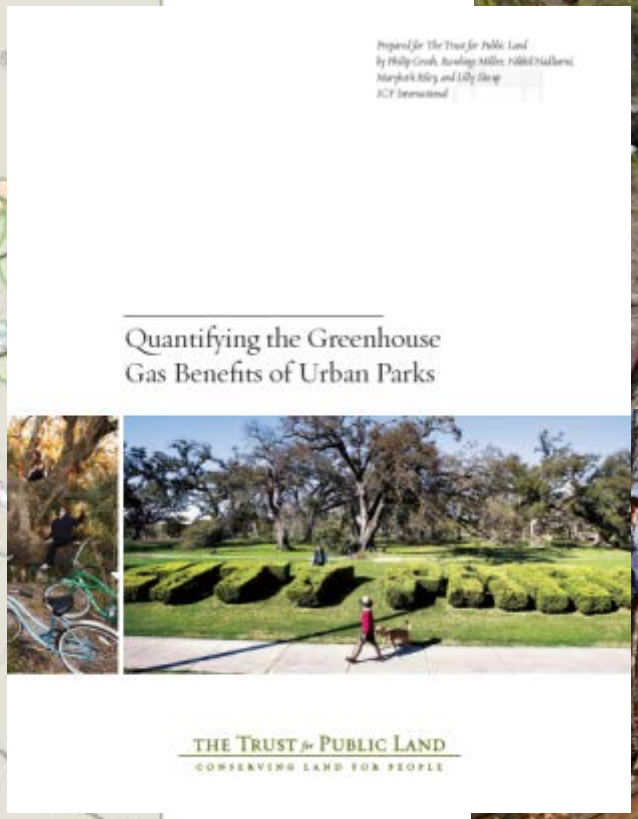
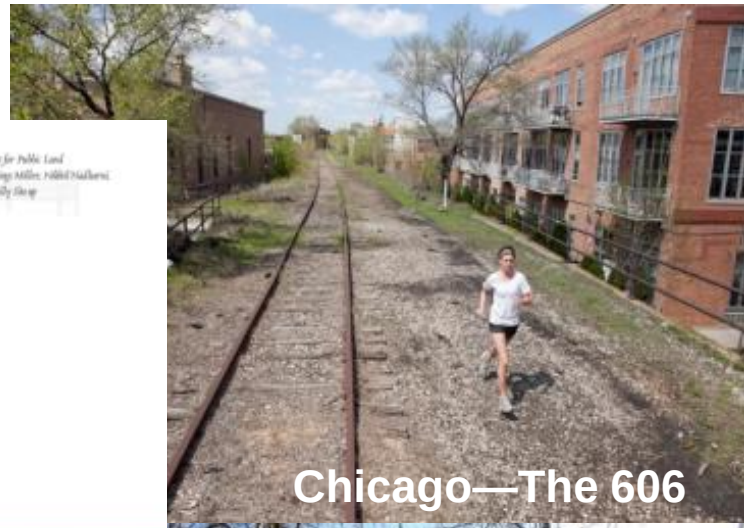
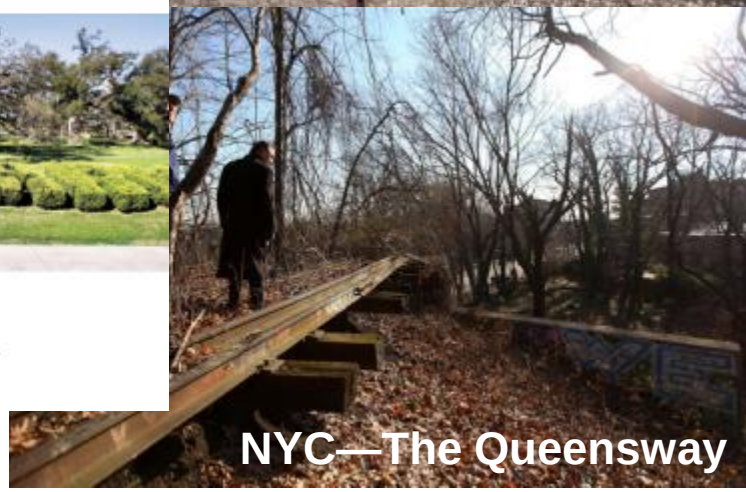
Connect—To Save ½ Lb. CO2 & 1.3 Cents in Health Care Costs Per Mile Diverted from Auto

Seattle—Eastside Rail Corridor





Chicago—The 606



NYC—The Queensway

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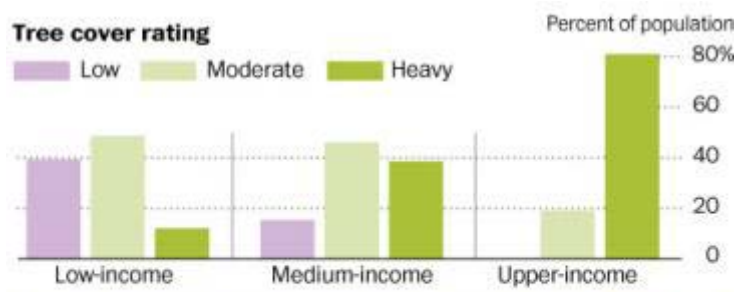
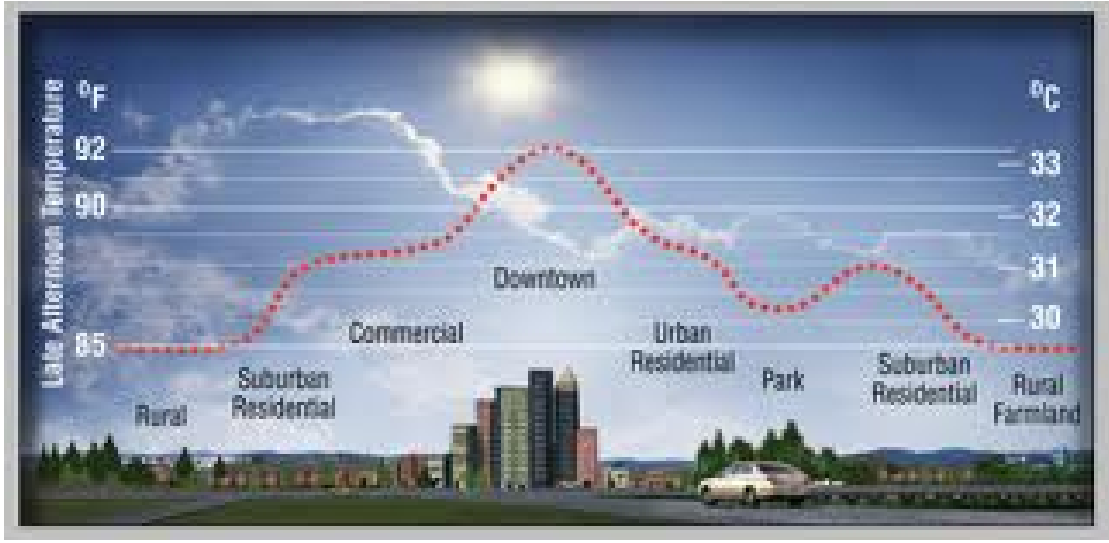
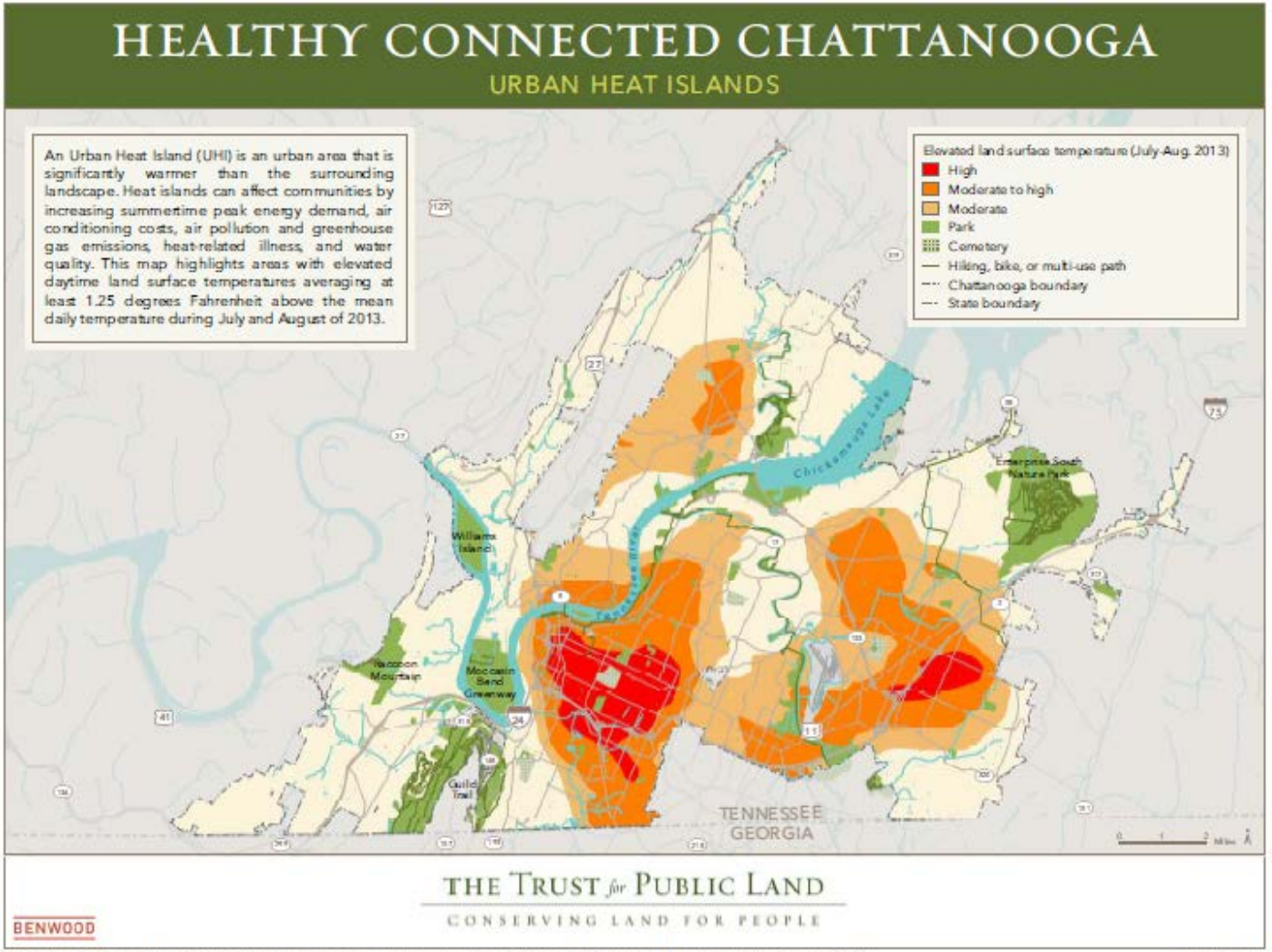




Cool—Add Green to Cool Air by 5-22 Degrees

Creating Climate Data to Fill Gaps—Chattanooga Heat Islands Example



Absorb—To Save Energy and Recharge Aquifers

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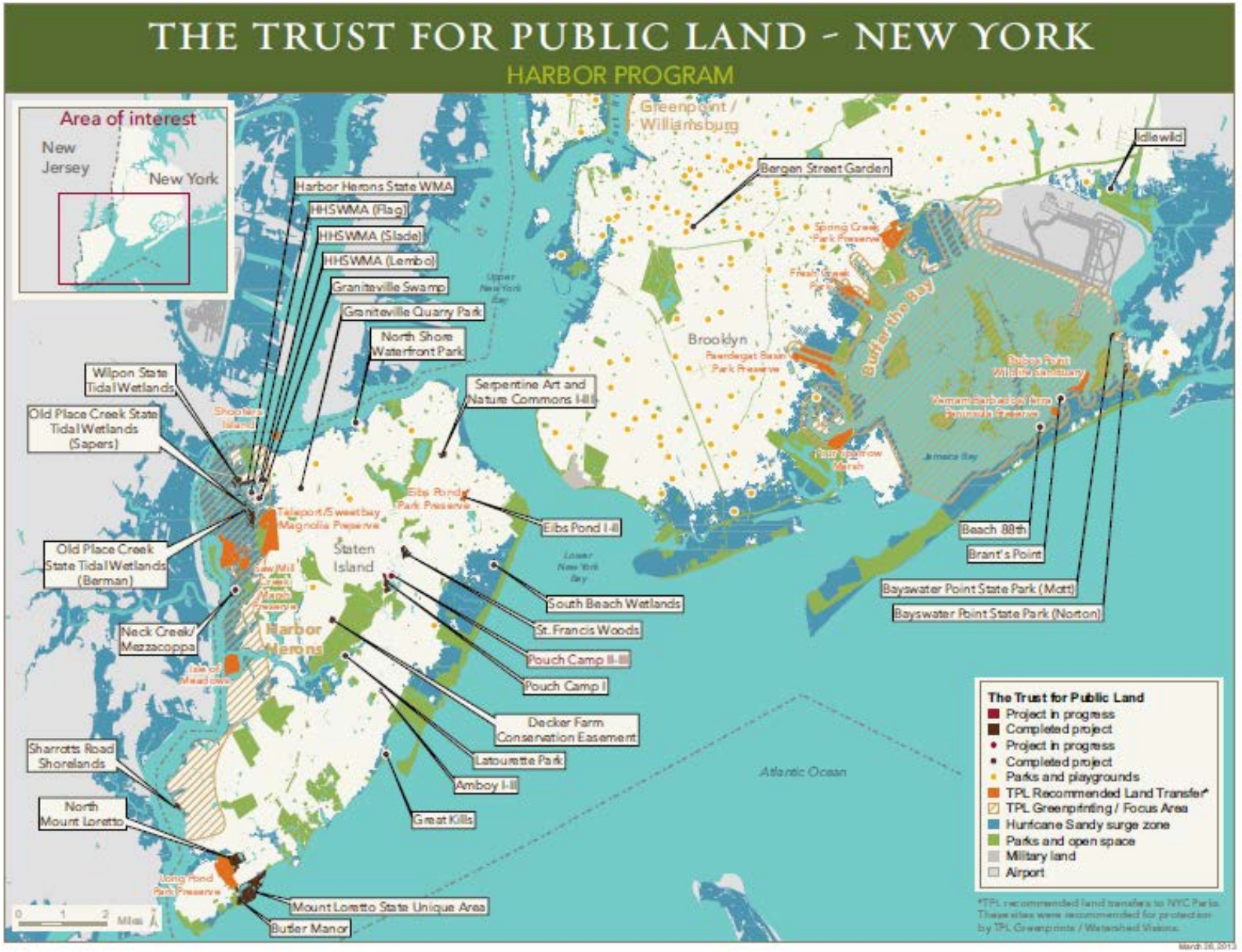
Protect—Green Shorelines to Buffer Cities

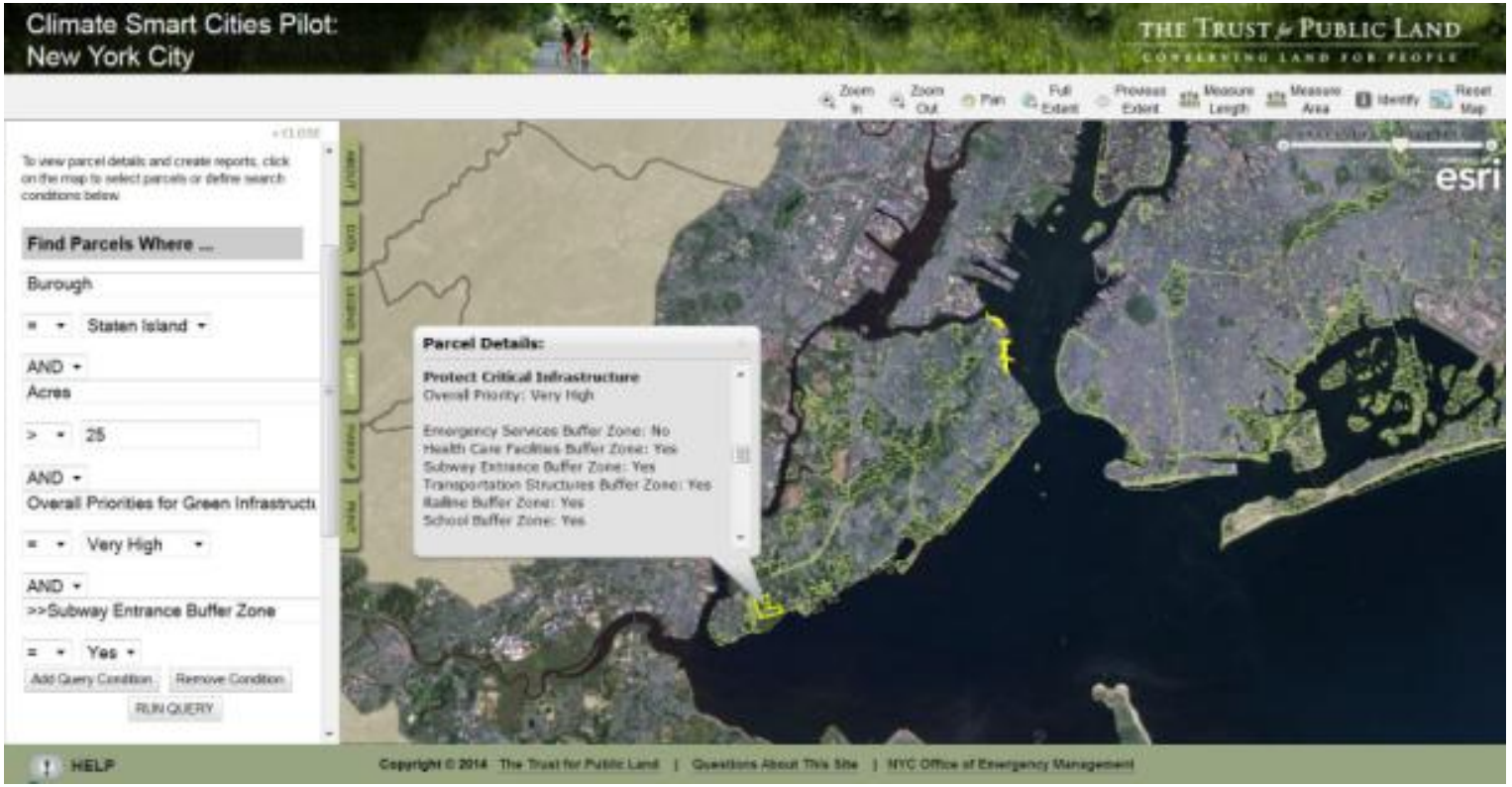
TPL Project: North Shore Park, Staten Island

TPL Project: Old Place Creek, Staten Island



Leveraging TPL's Strong History in NYC Resilience

Pilot: Green Shorelines to Protect NYC Waterfront



RESEARCH: Assess Past GI Performance

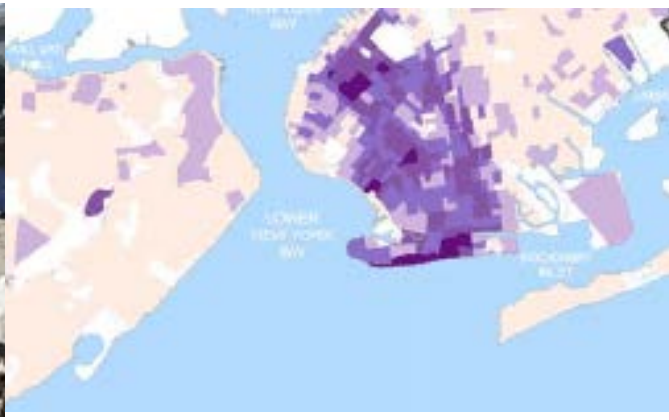
GIS: Target Highest Value Sites

DEMONSTRATE: Resilient Designs on Priority Sites

Research: How Did GI and Social Networks Function to Mitigate Damage from Sandy?

CCRUN

COLUMBIA UNIVERSITY



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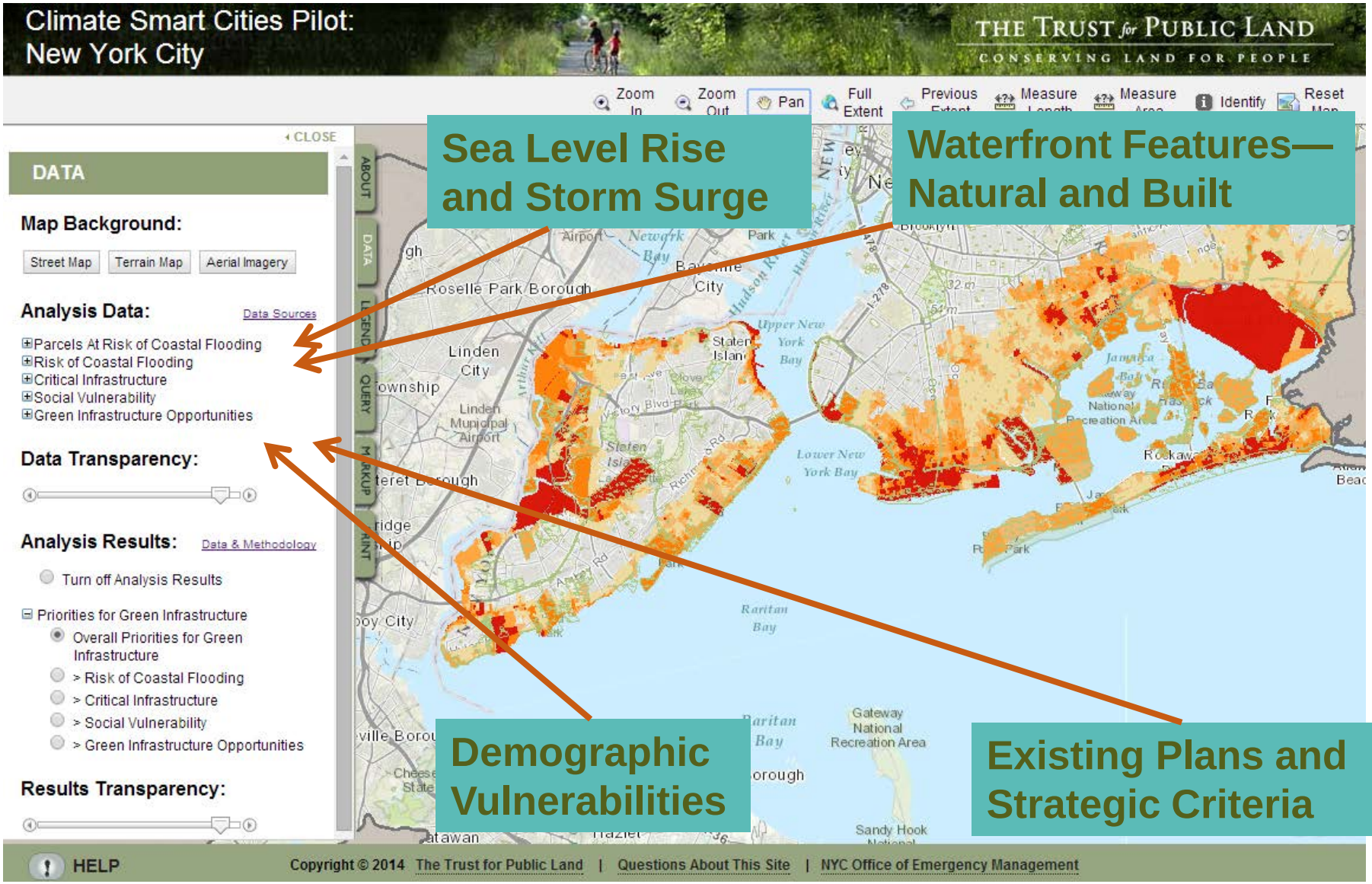
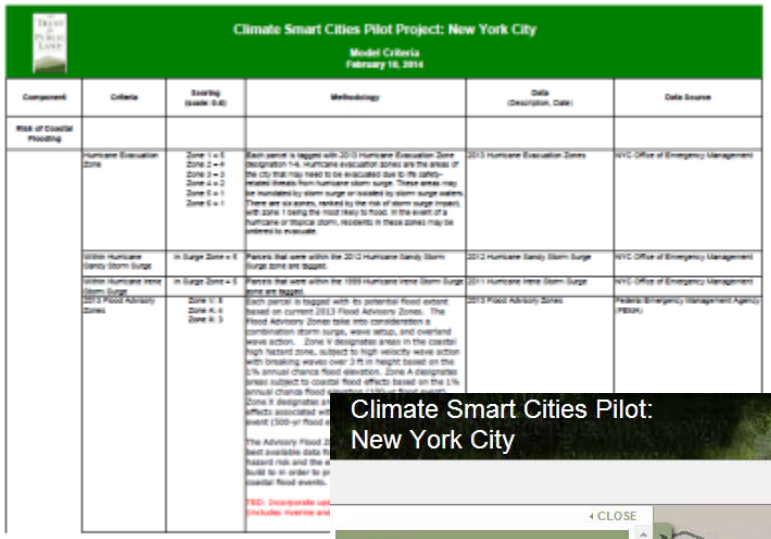
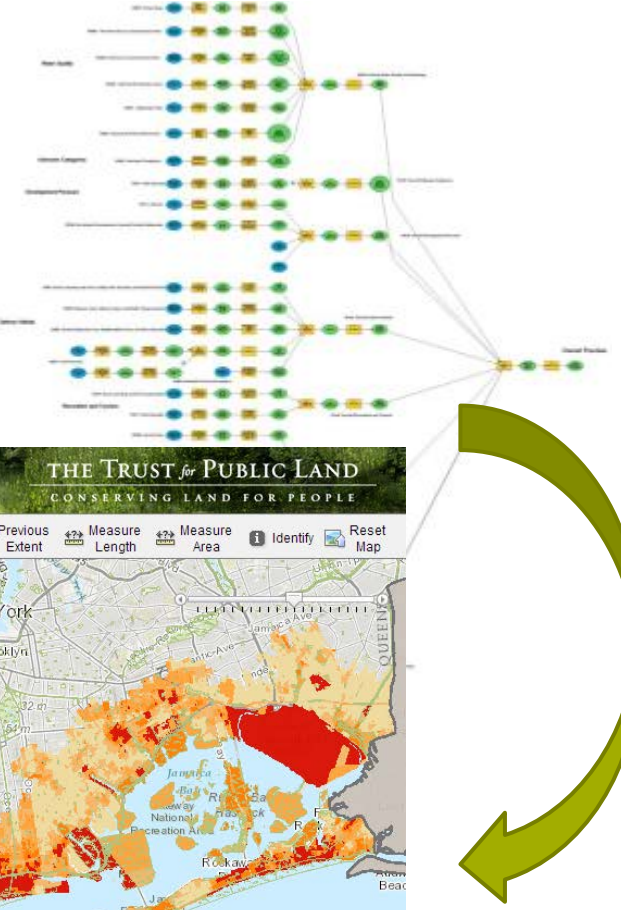
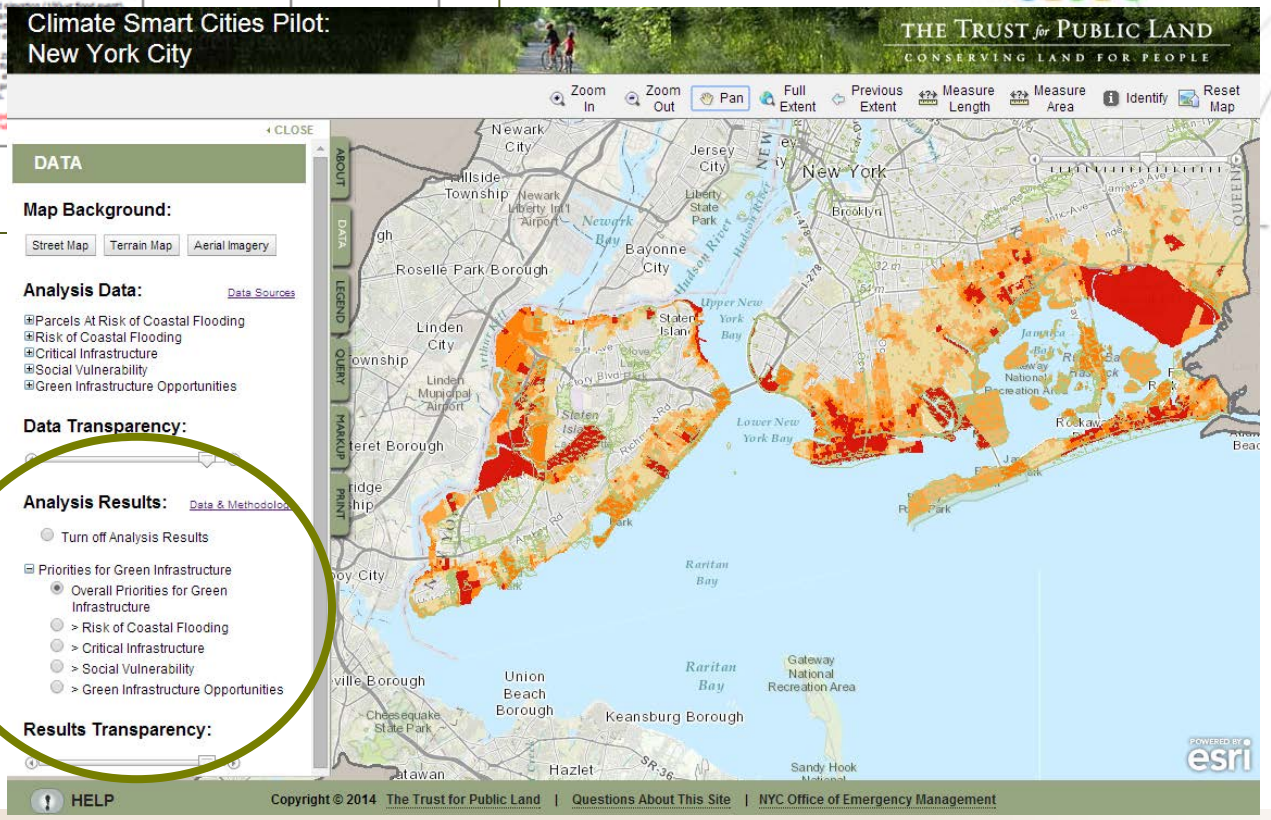
GIS: Online Portal for Decision Support from Project Selection to Policy Measures

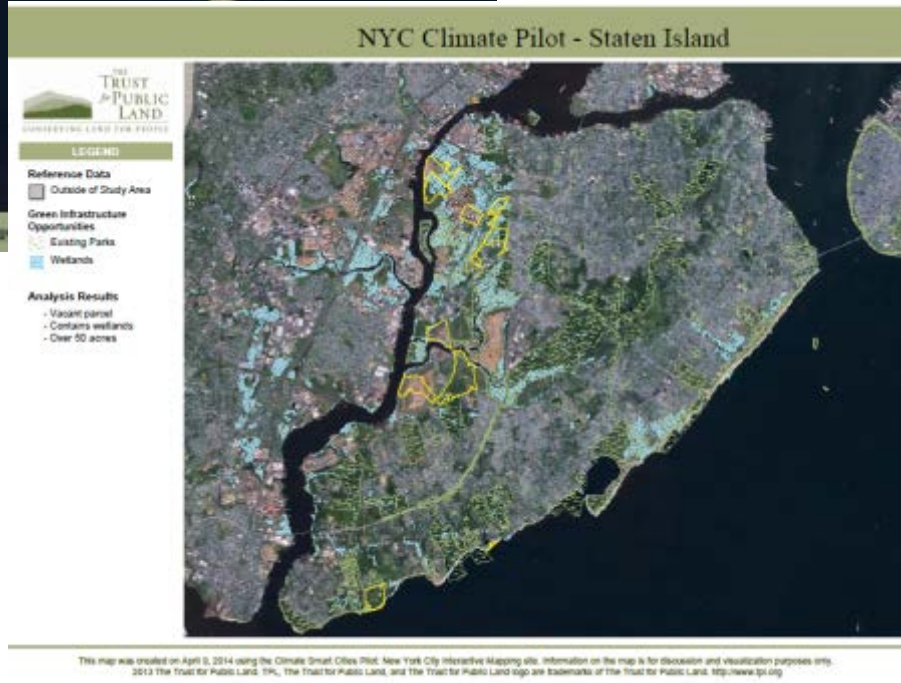








Portal: Use Data to Model Priorities



Portal: Use Query Function to Find High Value Parcels and Develop Parcel Priority Maps

Climate Smart Cities Pilot: New York City
Parcel Report

Parcel ID (BBL): 5052020173 | Acres: 1.9 | Borough: Staten Island

Priorities for Green Infrastructure

Overall Priority: Medium

- Mitigates Risk of Coastal Flooding: Very High
- Protects Critical Infrastructure: Low
- Protects Areas of Social Vulnerability: Low
- Opportunity for Green Infrastructure: High

LEGEND

Reference Data

Outside of Study Area

Green Infrastruoture Opportunities

Existing Parks

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Climate Smart Cities Pilot: New York City
Parcel Report

Parcel ID (BBL): 5052020173 | Acres: 1.9 | Borough: Staten Island

Mitigate Risk of Coastal Flooding - Priority: Very High

Hurricane Evacuation Zone: 1
Within Hurricane Sandy Storm Surge: Yes
Within Hurricane Irene Storm Surge: Yes
2013 Flood Advisory: High Hazard Zone
2020 Sea-Level Rise: 100-Year Floodplain
2050 Sea-Level Rise: 100-Year Floodplain
Storm Surge Innundation with Hurricane Category: 1

Protect Critical Infrastructure - Priority: Low

Within Emergency Services Buffer Zone: No
Within Health Care Facilities Buffer Zone: No
Within Subway Entrance Buffer Zone: No
Within Transportation Structures Buffer Zone: Yes
Within Railline Buffer Zone: No
Within School Buffer Zone: No

Protect Areas of Social Vulnerability - Priority: Low

Social Vulnerability Index: Medium Low
Percent Children 19 and Under in Census Blockgroup: 0.0
Percent Adults 65 and Older in Census Blockgroup: 0.0
Percent Low Income Households in Census Blockgroup: 0.0
Population Density (res/sqmi): 0.0

Identify Opportunities for Green Infrastructure - Priority: High

Vacant Parcel: Yes
Parcel Size in Acres: 1.9
Under Public Ownership: No
Existing Park: No
Adjacent to a Park: Yes
Has Playground: No
Has Community Garden: No
Cemetery: No
Park Under Construction or Remediation: No
Other Publicly Accessible Waterfront: No
Contains Wetlands: Yes
Within Business Improvement District: No
ParkScore Park Equity Analysis: High Park Need
School Property: No

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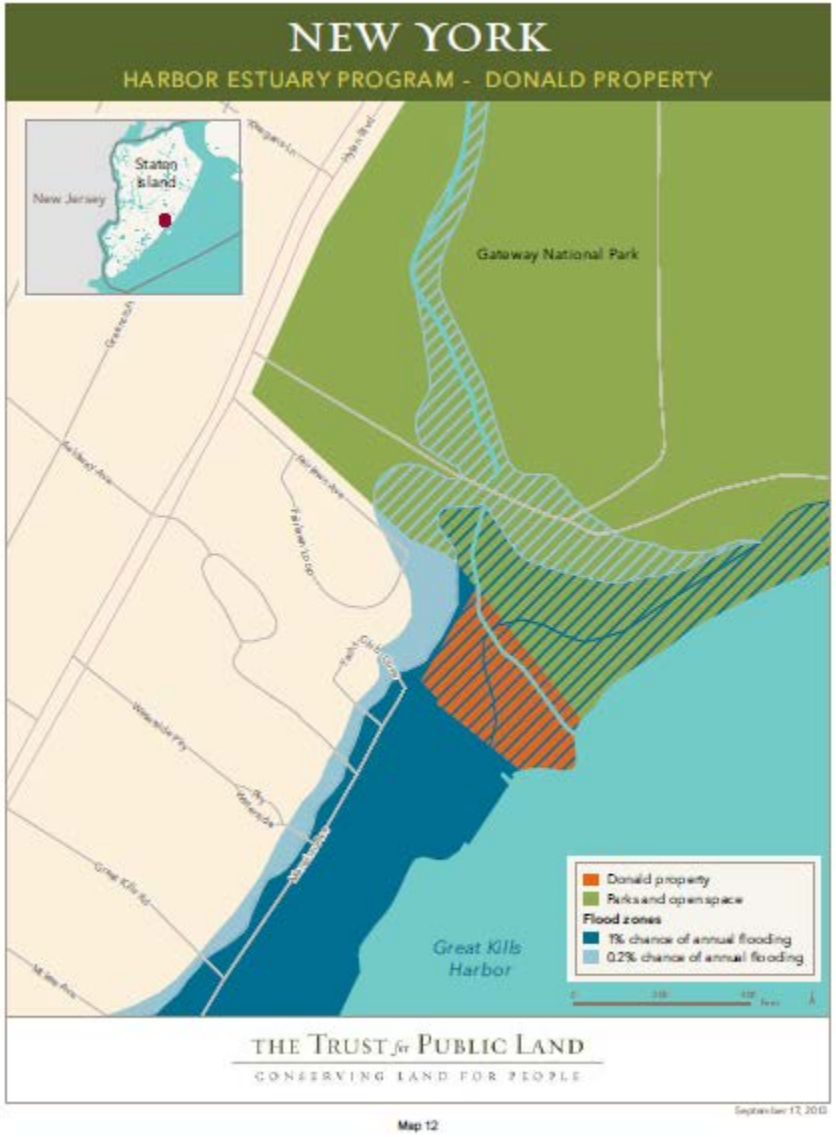
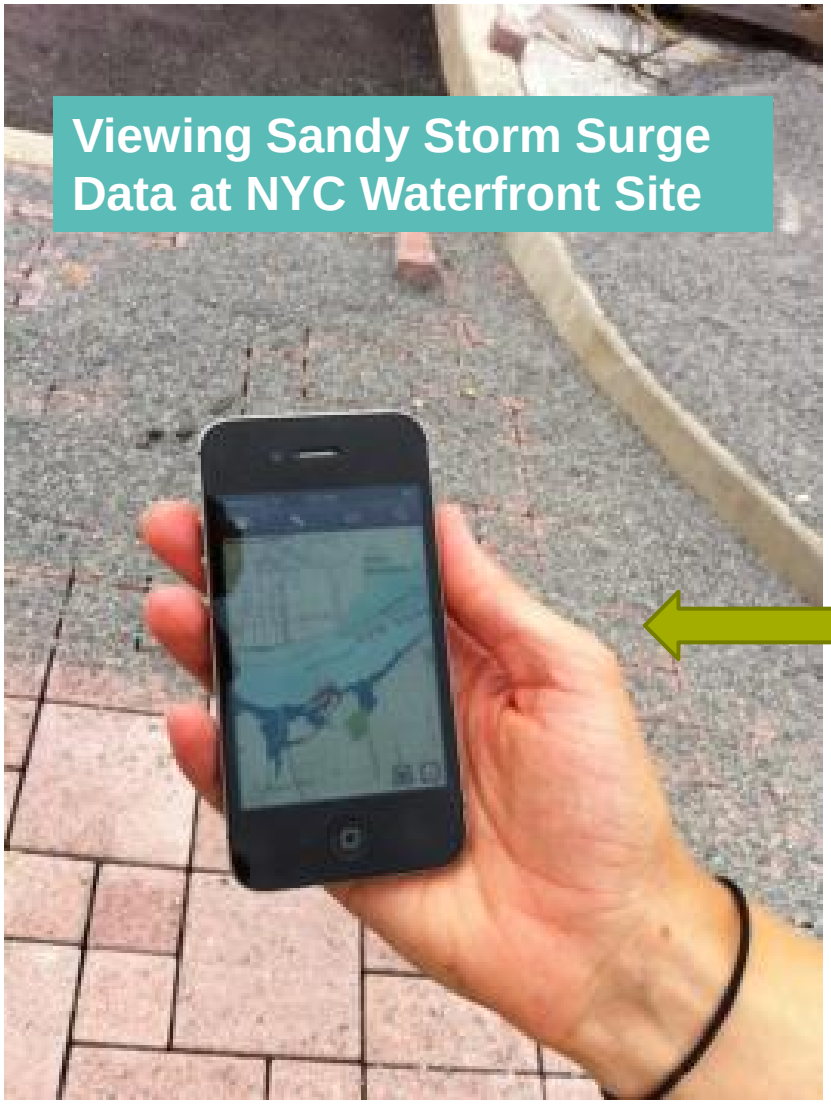
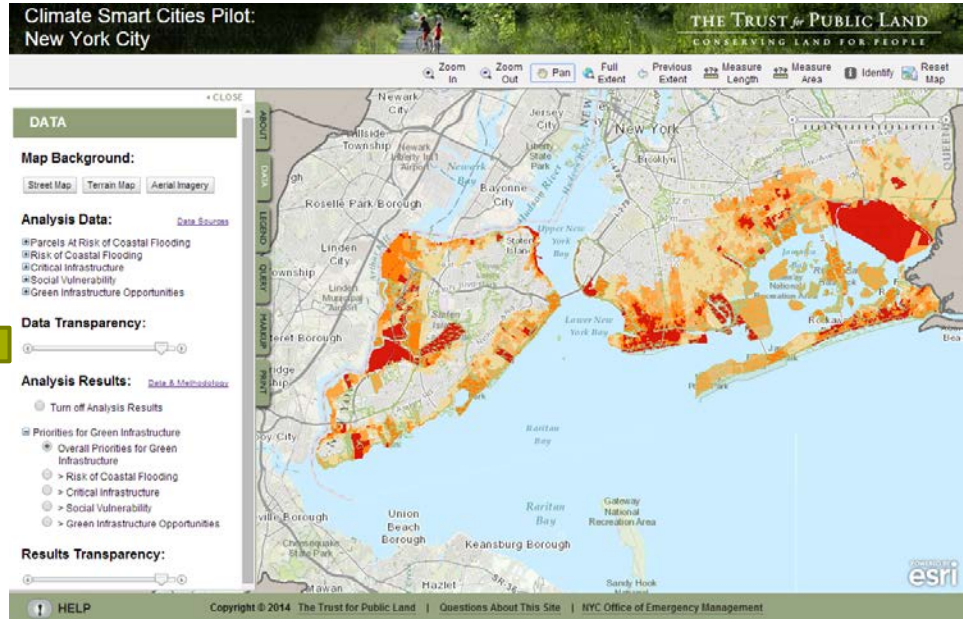
Portal: Run Data-Driven Parcel Reports



Portal: Use Data to Make Project Maps Showing Climate Relevance





Portal: Take Data to the Field

Pilot: L.A. Green Alleys to Connect, Cool and Absorb

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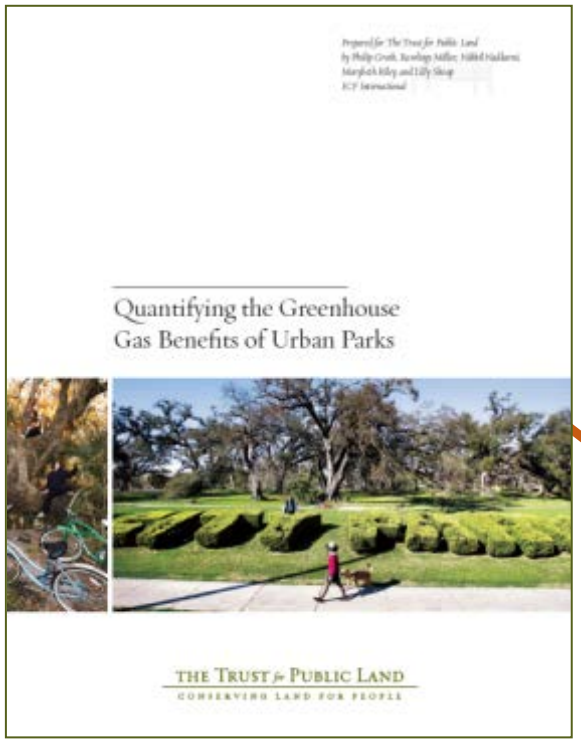
SAIT LANDSCAPE

RESEARCH: Cost-Benefit Analysis at City Scale

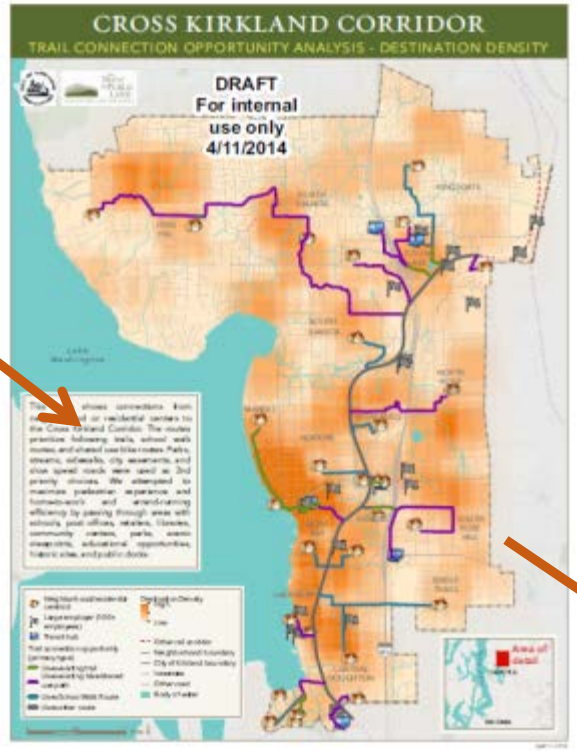
GIS: Optimize Green Alley Siting with Climate Data

DEMONSTRATION: Avalon Neighborhood

Pilot: Eastside Rail Conversion to Connect Seattle



Research: Quantify CO2 Mitigation



GIS: Model for Hyper-Connectivity

CITY OF KIRKLAND WASHINGTON

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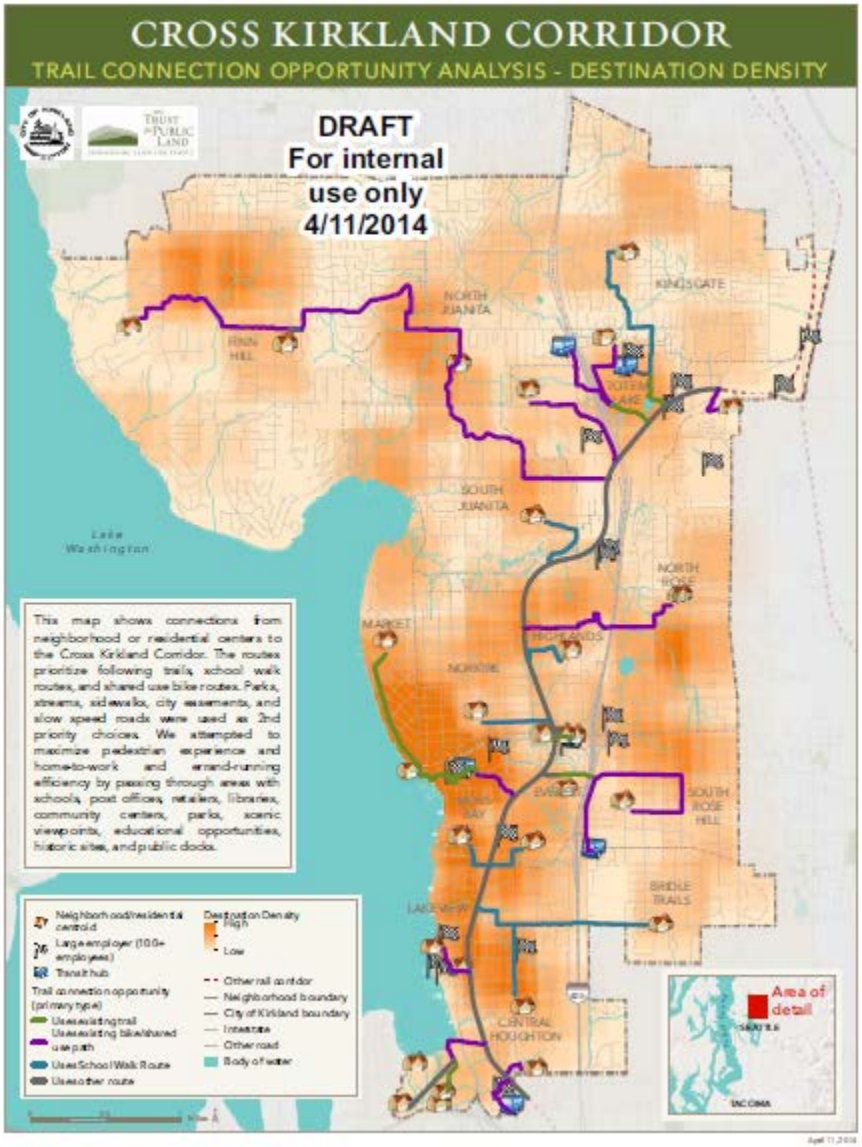
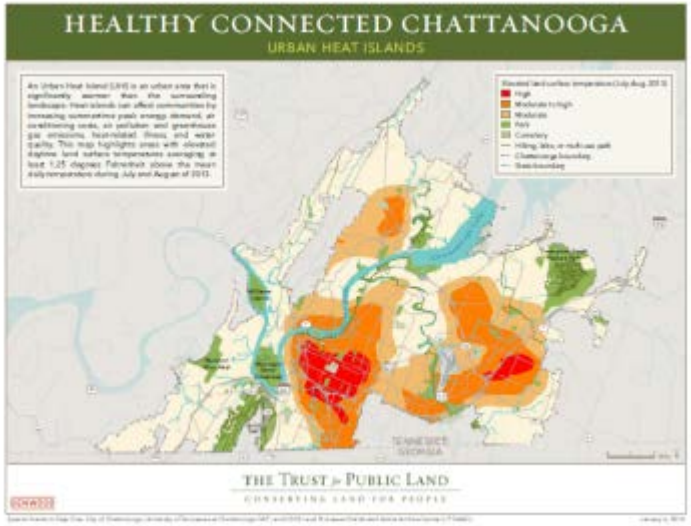
Demonstration: Connect + Absorb



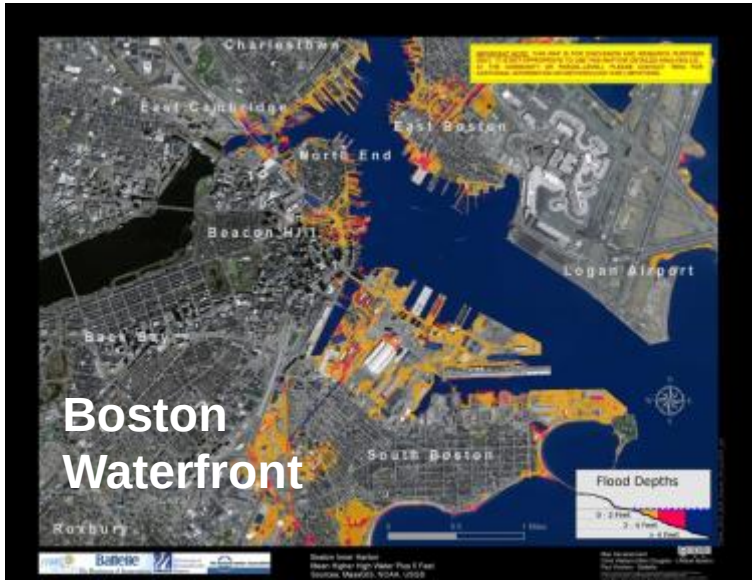
Using Modeling to Design Hyper-Connectivity for Lower CO2 Emissions from Transportation

Other Trust for Public Land Climate-Smart Cities



Green Line Corridor Connectivity—Twin Cities

Miami-Dade Western Greenway—SLR and Surge Buffer



Boston Waterfront