



Rocky Mountain Land Use Institute Conference
March 12 – 13, 2015

**Climate Smart Cities:
Using GIS for Climate Resiliency and
Scenario Planning**

Breece Robertson
National GIS Director

THE TRUST *for* PUBLIC LAND

LAND FOR PEOPLE

Our Mission

The Trust for Public Land conserves land for people to enjoy as parks, gardens, and other natural places, ensuring livable communities for generations to come.



Leadership in GIS and Planning Applications

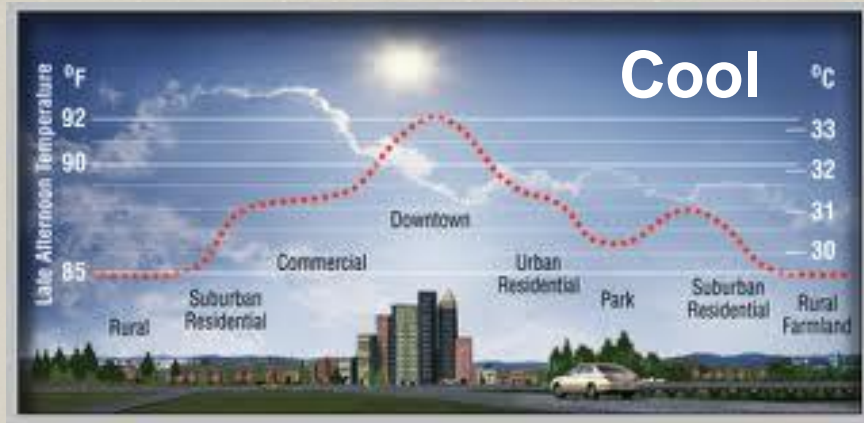


Green Cities to Become Climate-Smart

Connect



Cool



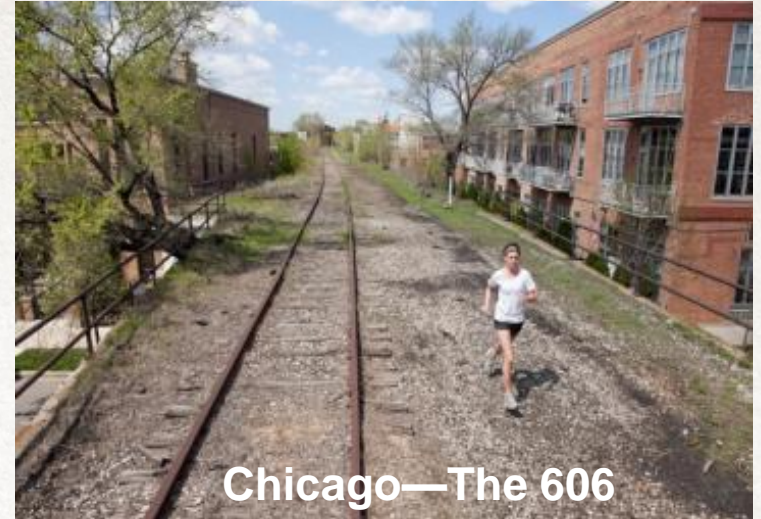
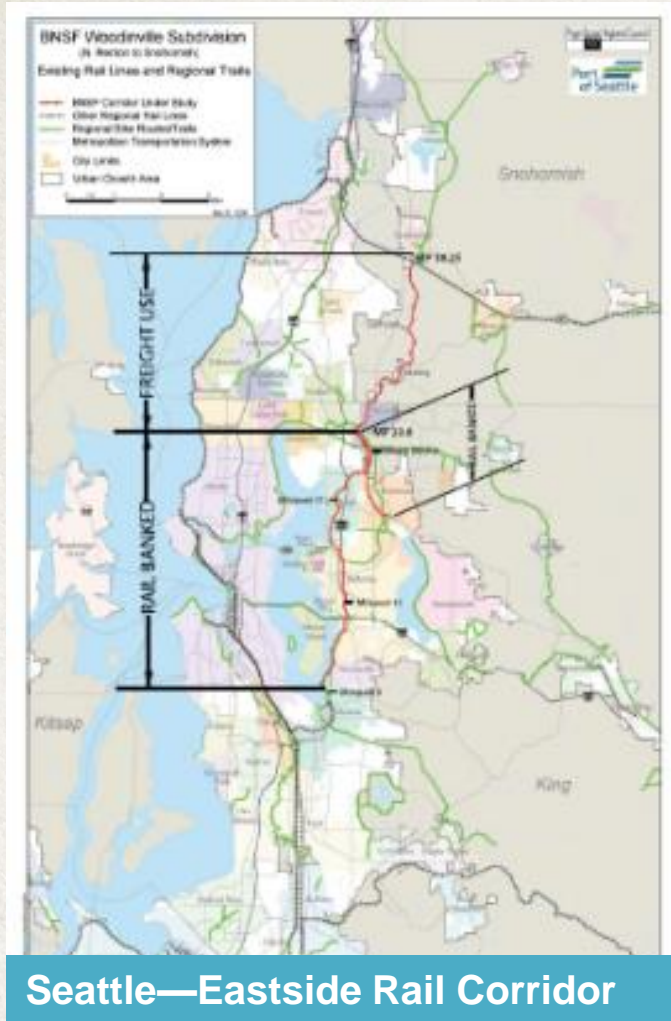
Absorb



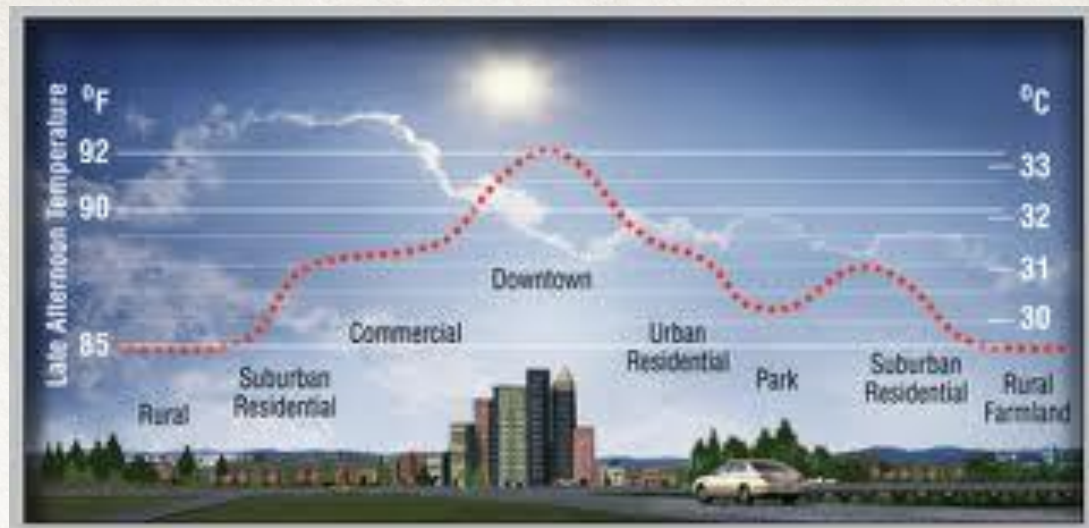
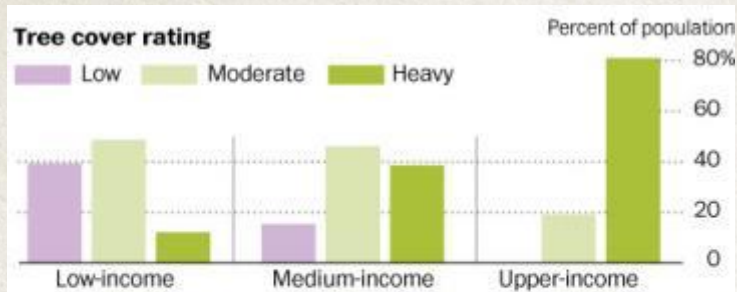
Protect



Connect – To Save ½ Lb. CO2 & 1.3 Cents Per Mile



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



Absorb – To Clean Urban Waters & Recharge Aquifers

Ballona Wetlands



Los Angeles Green Alleys




LA River Restoration



Protect – Green Shorelines to Buffer Cities









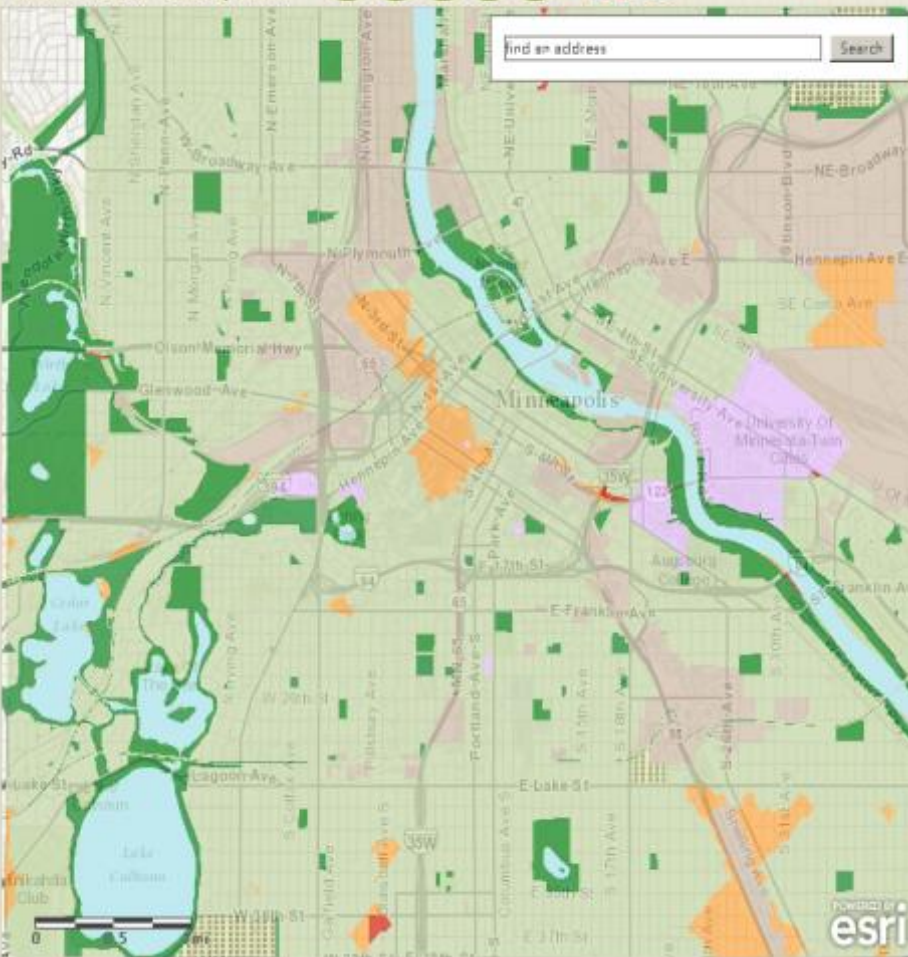
*North Shore Park,
Staten Island*



*Old Place Creek,
Staten Island*

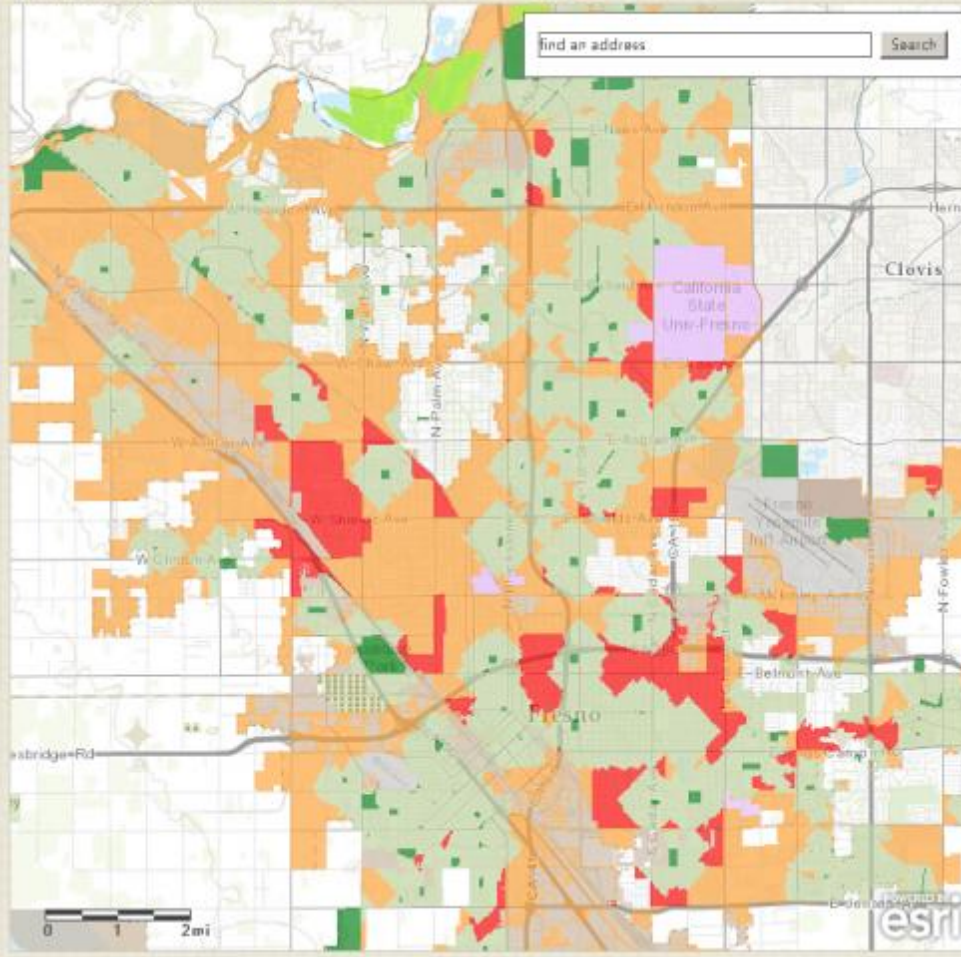
MINNEAPOLIS, MN

     = **81.0** ParkScore 



FRESNO, CA








     = **27.5** ParkScore 



MINNEAPOLIS, MN



[DOWNLOAD MAP & TABLES](#)

Rank 	Population 	Acreage 		Services & Investment 		Access 	Raw Score 	ParkScore 
1 out of 50	379,969	27 MAX 40		32 MAX 40		38 MAX 40	97 MAX 120	81.0 MAX 100
		Median Park Size	Park Land as % of City Area	Spending per Resident	Playgrounds per 10,000 Residents			
		12 MAX 20	15 MAX 20	20 MAX 20	12 MAX 20			

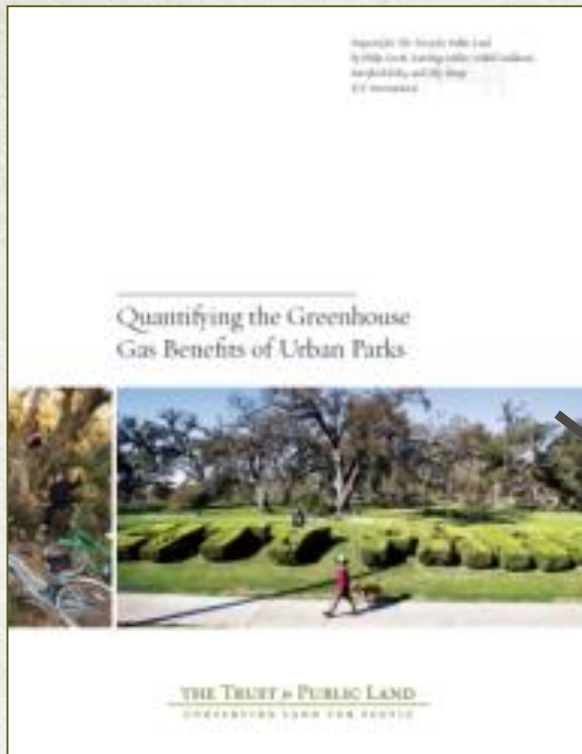
FRESNO, CA



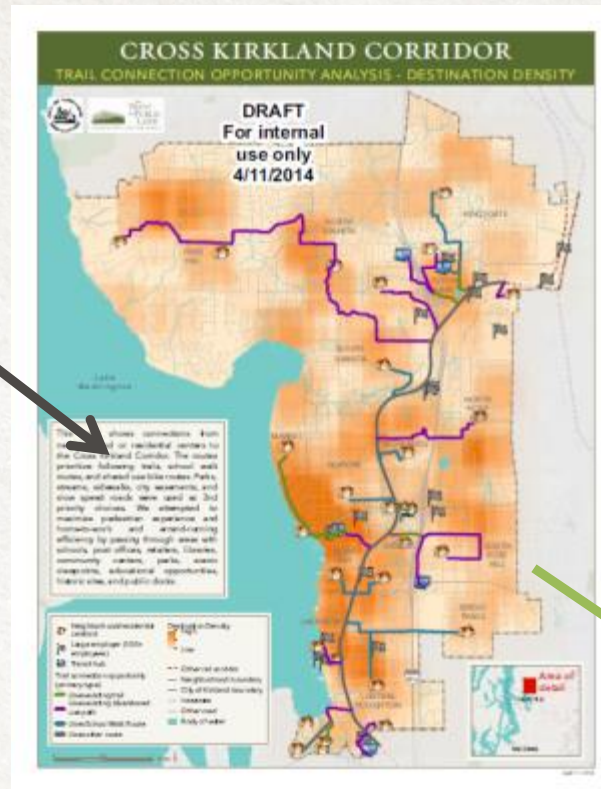
[DOWNLOAD MAP & TABLES](#)

Rank 	Population 	Acreage 		Services & Investment 		Access 	Raw Score 	ParkScore 
50 out of 50	468,337	10 MAX 40		7 MAX 40		16 MAX 40	33 MAX 120	27.5 MAX 100
		Median Park Size	Park Land as % of City Area	Spending per Resident	Playgrounds per 10,000 Residents			
		9 MAX 20	1 MAX 20	5 MAX 20	2 MAX 20			

Climate-Smart Cities Pilot: *Eastside Rail Conversion to **Connect** Seattle*



RESEARCH:
Quantify CO2
Reductions

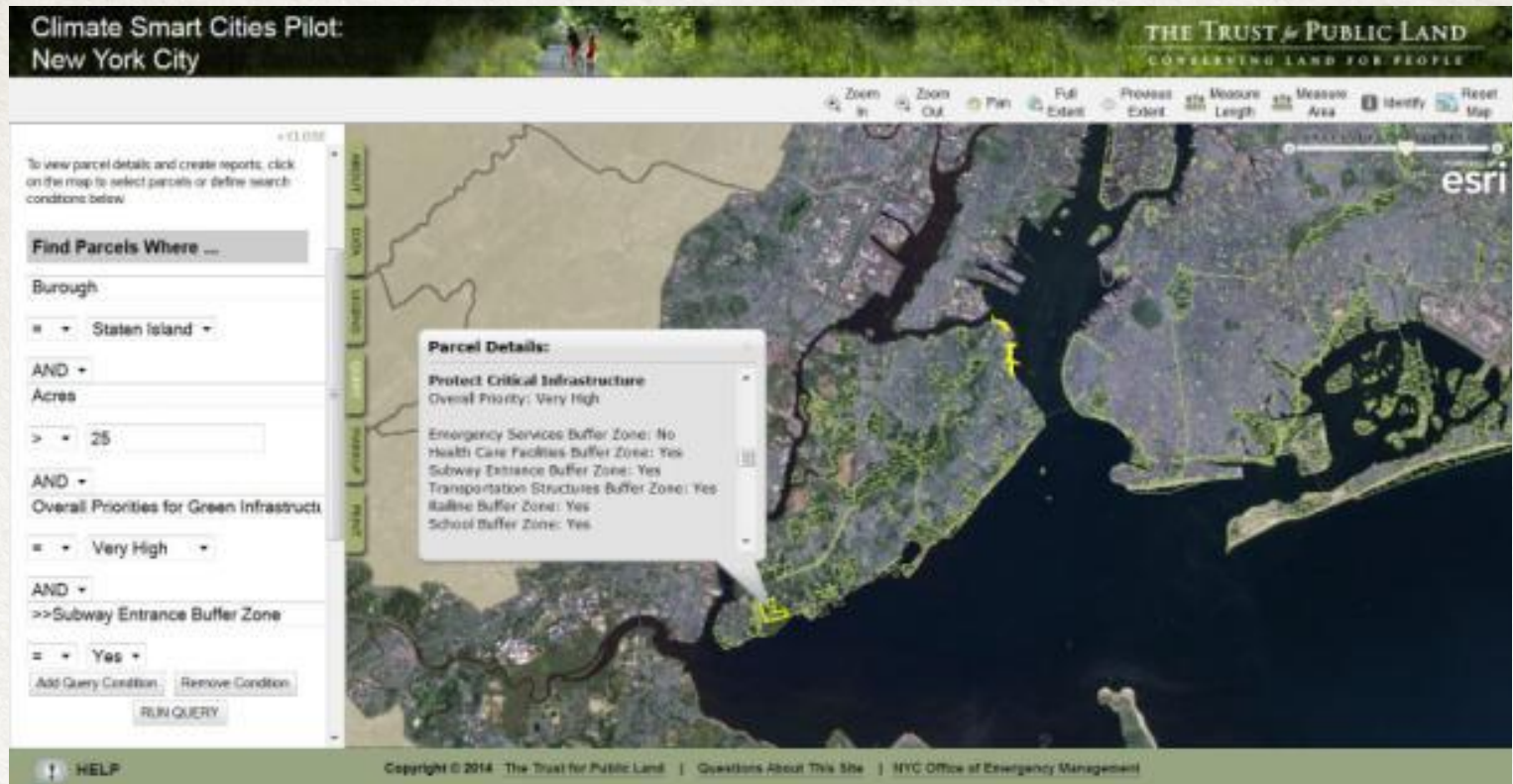


**GIS: Design
Connected
Network**



DEMONSTRATION:
Connect + Absorb

Climate-Smart Cities Pilot: Green Shorelines to *Protect* NYC Waterfront



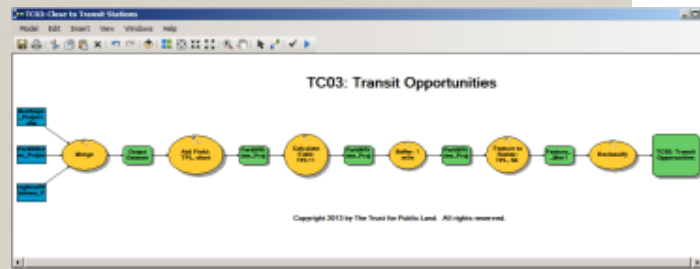
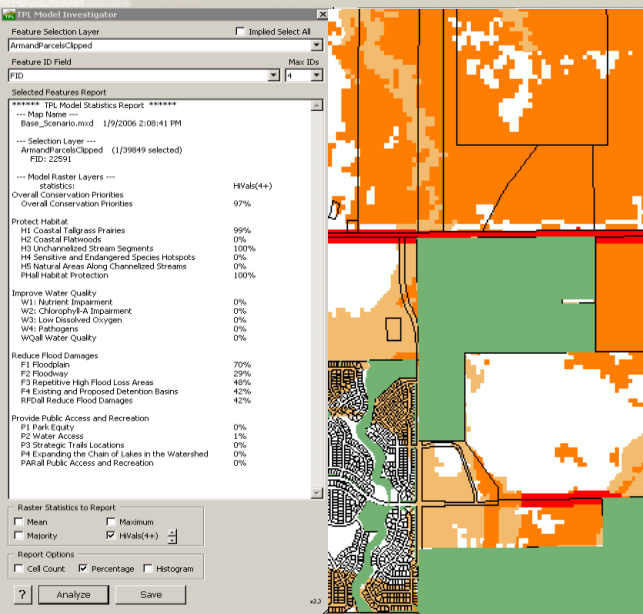
RESEARCH: Assess Past Performance of Green Buffers

GIS MAPPING: Target Highest Value Sites

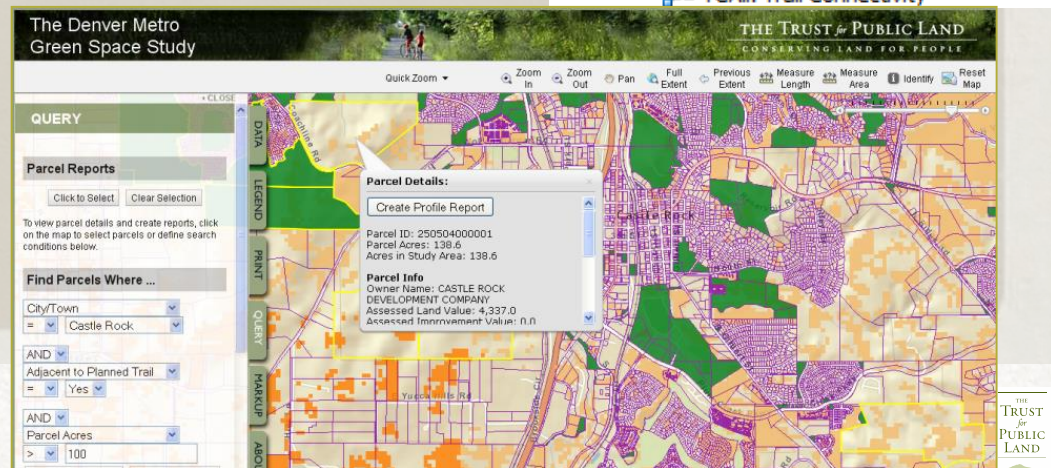
DEMONSTRATION: Innovative Designs on Priority Sites

TPL Uses ESRI Software + Custom TPL Tools

- ArcGIS Desktop
- Modelbuilder
- Spatial Analyst and Network Analyst
- Custom TPL Interactive mapping site (ArcGIS Server, Javascript API)
- Custom TPL parcel reporting tools

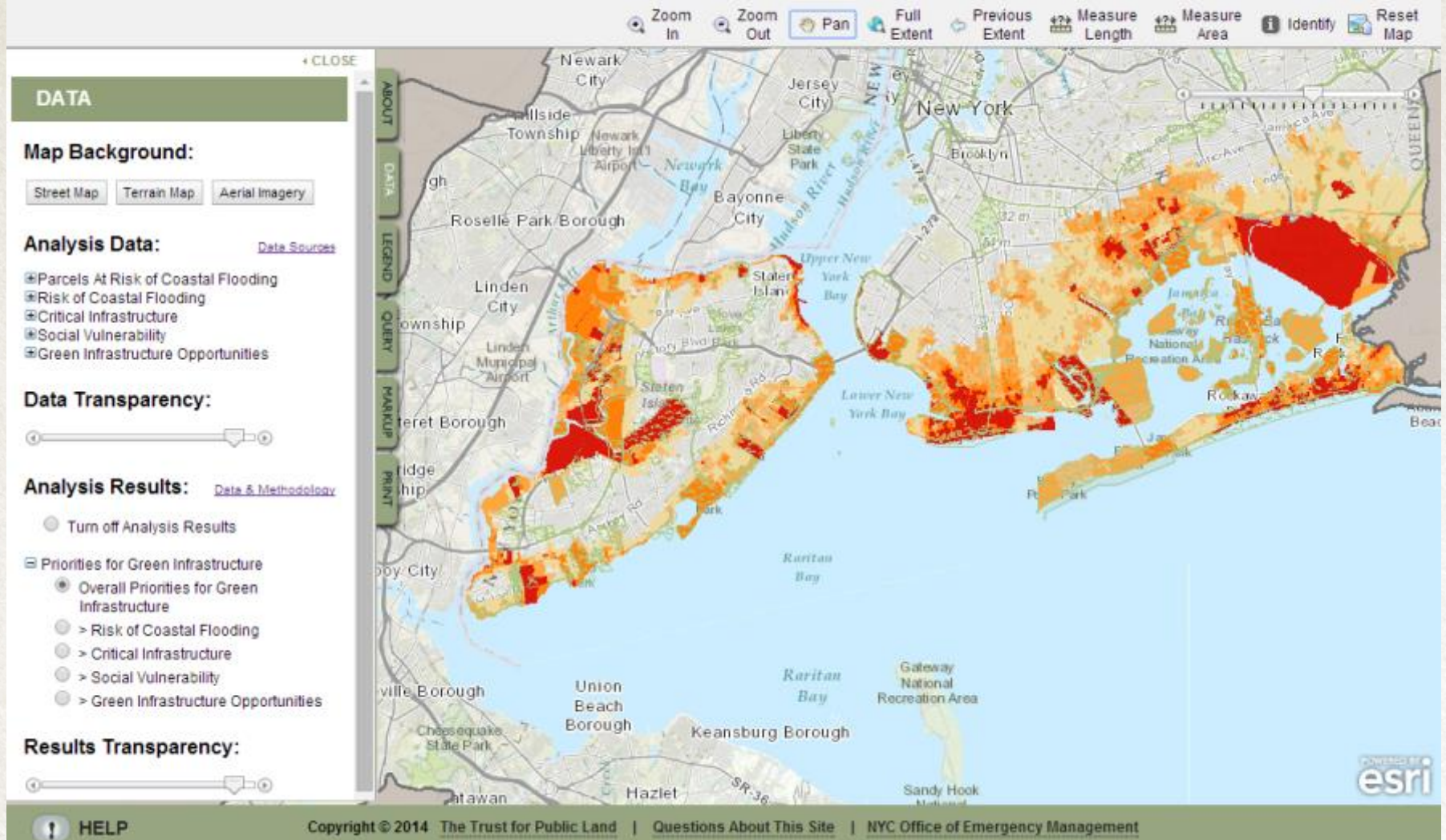


- Denver_Metro_GOCO_Models
 - PE: Network Park Equity
 - PE: Park Equity
 - PP: Parcel Prioritization
 - RH: Riparian Corridors Habitat Protection Analysis
 - TC: Trail Connectivity
 - Low Trail Density
 - TC01: Low Trail Density
 - Trail Needs
 - TC03: Close to Transit Stations
 - TC07: High % of Kids Under 19
 - TC08: High Population Density
 - TC09: Close to Schools
 - Trail Needs - All
 - Trail Opportunities
 - TC02: Vacant Lands
 - TC04: Opportunities Close to Streams
 - TC05: Planned Trail Opportunities
 - TC06: Natural Land Cover
 - Trail Opportunities - All
 - TCALL: Trail Connectivity



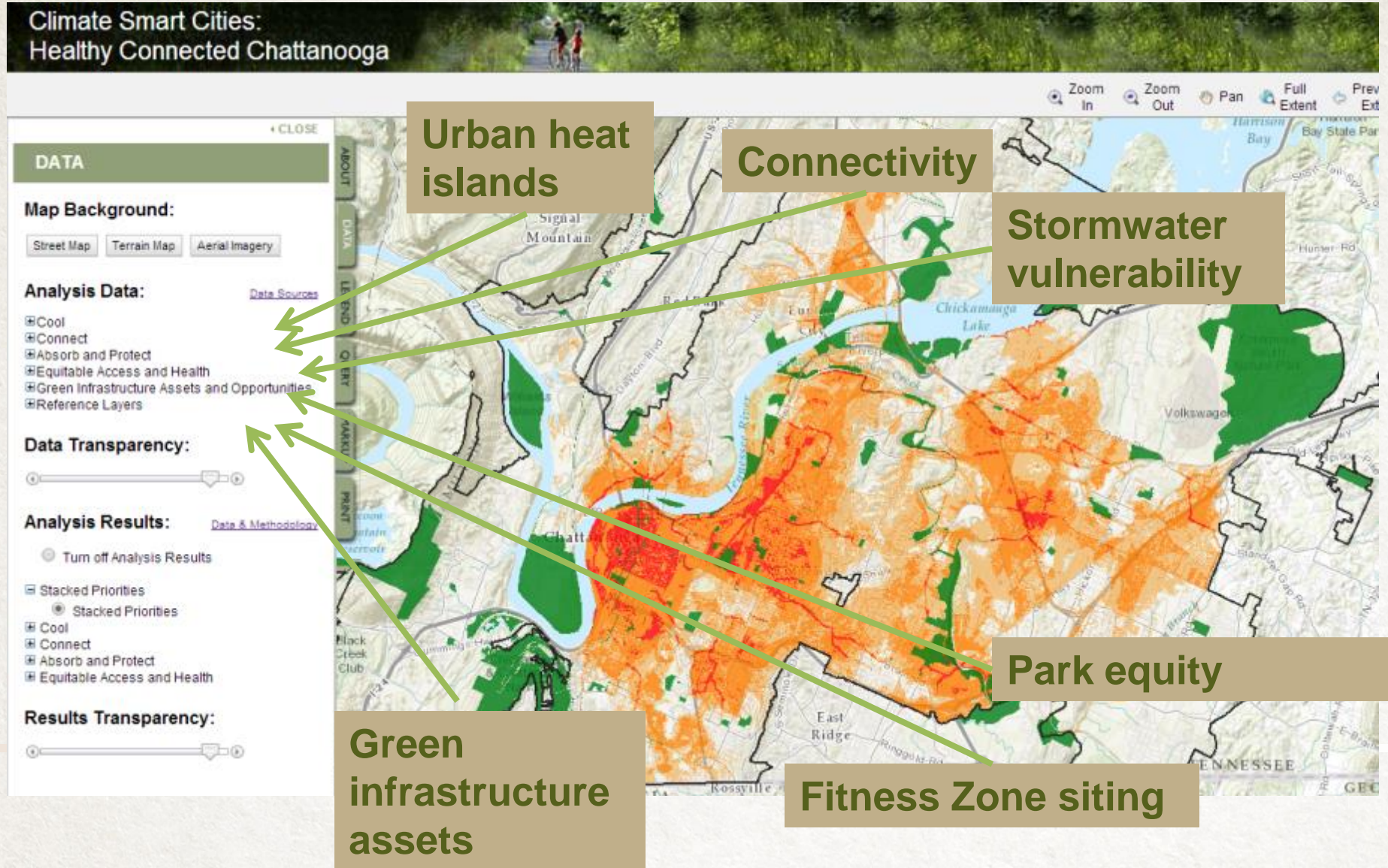
Climate Smart Cities Pilot: New York City

THE TRUST for PUBLIC LAND
CONSERVING LAND FOR PEOPLE

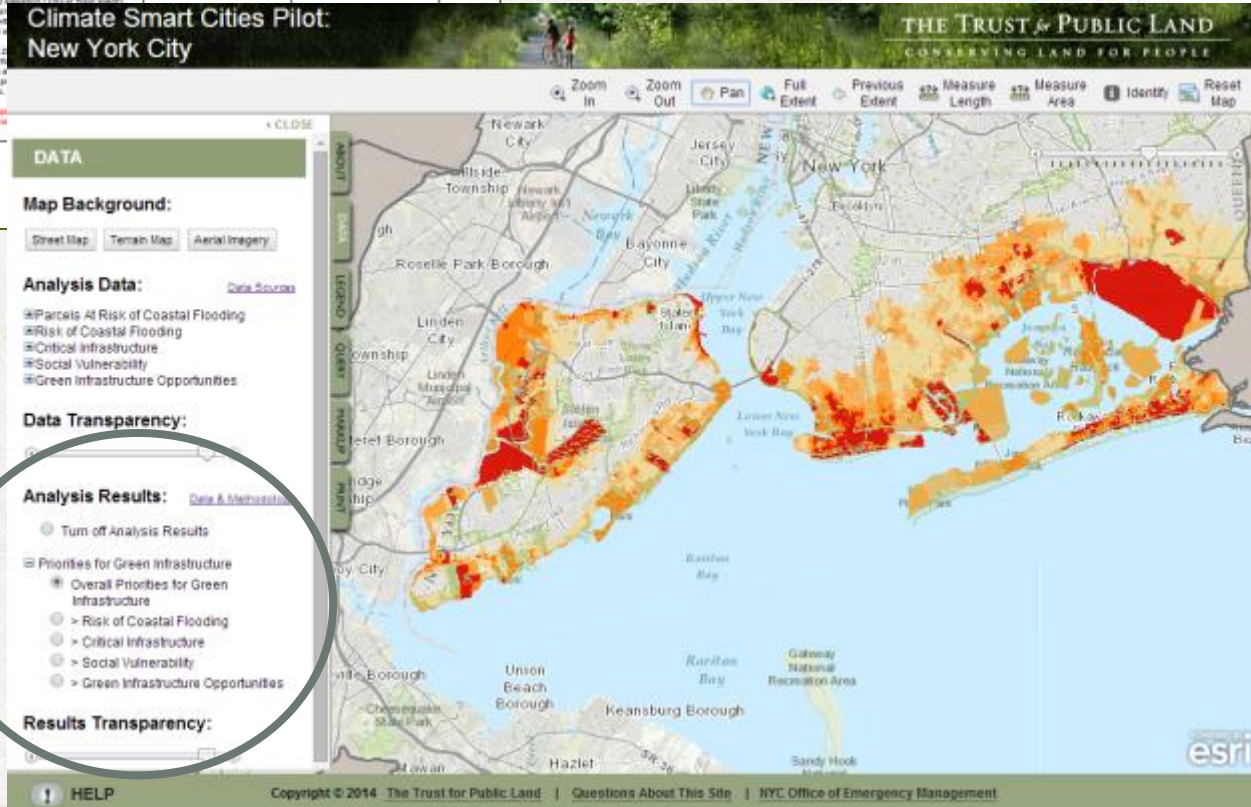
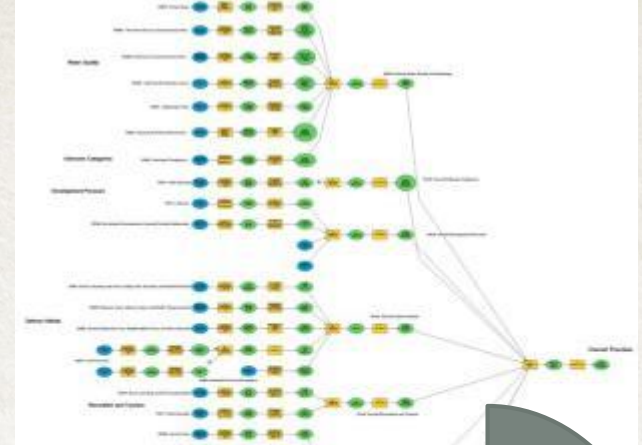


TPL's Custom Online GIS Platform (Portal) Applies Data and Planning to Specific Locations for Analysis

The Online Decision Support Tool Integrates All Relevant Data and Completed Modeling



Climate Smart Cities Pilot Project: New York City					
Model Criteria February 16, 2014					
Component	Criteria	Severity (Scale 0-5)	Methodology	Data (Observed, Date)	Data Source
Risk of Coastal Flooding	Hurricane Evacuation Zone	Zone 1 = 4 Zone 2 = 4 Zone 3 = 3 Zone 4 = 2 Zone 5 = 1 Zone 6 = 1	Each parcel is tagged with 2013 Hurricane Evacuation Zone designation (4 = hurricane evacuation zones are the areas of the city that may need to be evacuated due to its vulnerability to coastal flooding from hurricane storm surge. These areas may be inundated by storm surge or flooded by storm surge waters. There are no areas, related to the risk of storm surge impact, with Zone 1 being the most likely to flood. In the event of a hurricane or tropical storm, residents in these zones may be ordered to evacuate).	2013 Hurricane Evacuation Zones	NYC Office of Emergency Management
	2013 Hurricane Sandy Storm Surge	In Surge Zone = 5 Not in Surge Zone = 0	Parcels that were within the 2013 Hurricane Sandy Storm Surge zone are tagged.	2013 Hurricane Sandy Storm Surge	NYC Office of Emergency Management
	2013 Flood Advisory Zones	In Flood Zone = 5 Not in Flood Zone = 0	Each parcel is tagged with its potential flood extent based on current 2013 Flood Advisory Zones. The Flood Advisory Zones take into consideration a combination of storm surge, wind setup, and overland wave action. Zone V designates areas in the coastal high hazard zone, subject to high velocity wave action with breaking waves over 3 ft in height based on the 1% annual chance flood elevation. Zone A designates areas subject to coastal flood effects based on the 1% annual chance flood elevation.	2013 Flood Advisory Zones	Public Emergency Management Agency (PEMA)
	2013 Flood Hazard Zones	Zone V = 5 Zone A = 4 Zone B = 3	Zone B designates areas subject to coastal flood effects based on the 1% annual chance flood elevation. Zone B designates areas subject to coastal flood effects based on the 1% annual chance flood elevation. The Advisory Flood 2 is the best available data to assess risk and the flood is in order to protect flood events.		



The Data in the Portal Can Be Combined to Model Priorities at the City-Scale

Climate Smart Cities: Healthy Connected Chattanooga

THE TRUST for PUBLIC LAND
CONSERVING LAND FOR PEOPLE

Zoom In Zoom Out Pan Full Extent Previous Extent Measure Length Measure Area Identify Reset Map

Find Parcels Where ...

Overall: Stacked Priorities - has priority acre

= Yes

AND

>>Combined Sewer System Areas

= Yes

AND

Goal: Equitable Access and Health - has pri

= Yes

AND

>>Vacant

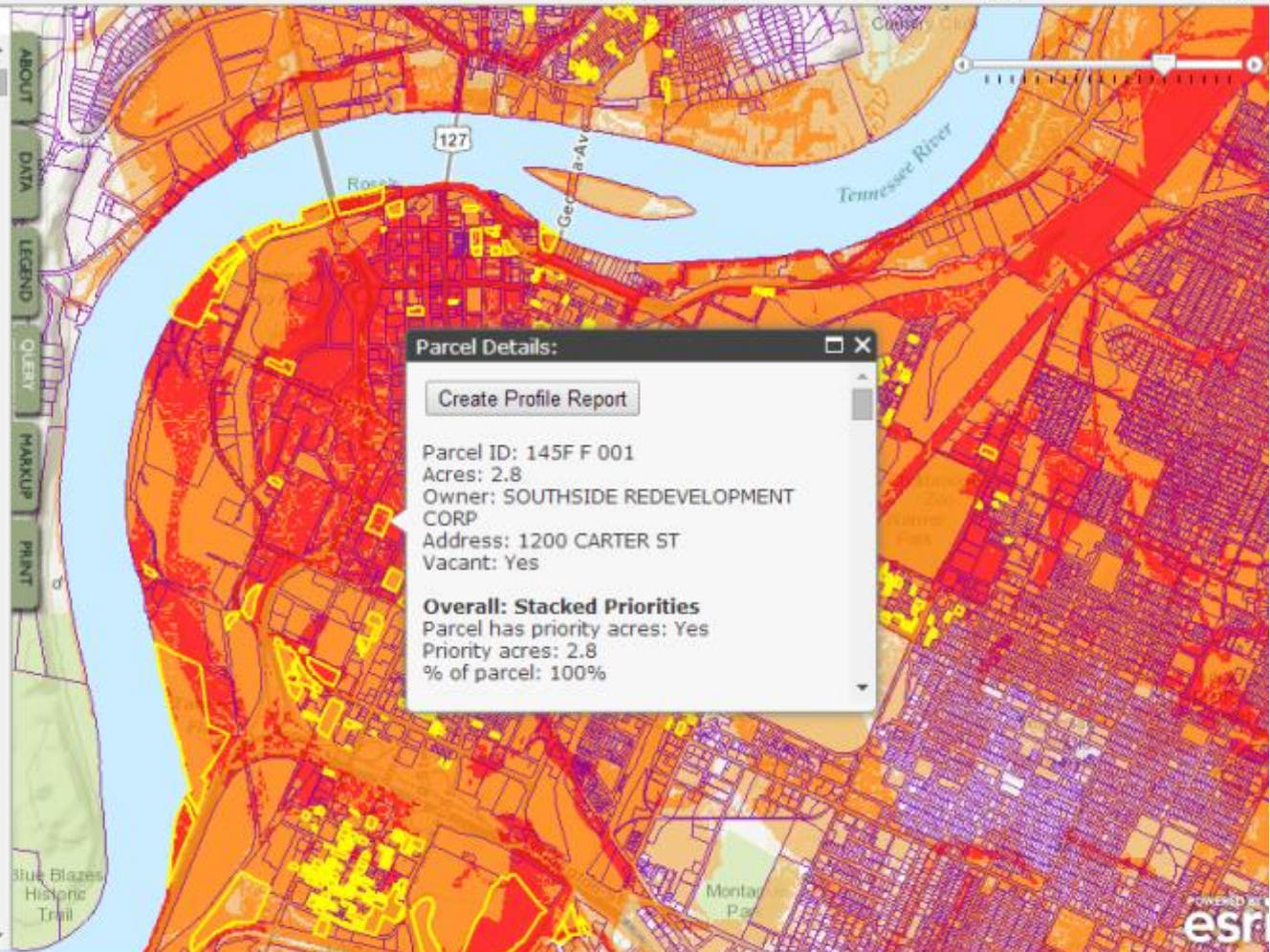
= Yes

Add Query Condition

Remove Condition

RUN QUERY

Query Results



! HELP

Copyright © 2014 The Trust for Public Land | Questions About This Site | Benwood Foundation

Climate Smart Cities: Healthy Connected Chattanooga Parcel Report

Parcel ID: 136C B 001

Owner: CINCINNATI NEW ORLEANS & TEXAS

Acres: 26.0

LEGEND

Reference Data

- City Limits
- Parcels
- Parks
- Vacant Parcels

Analysis Results

Stacked Priorities

- High Priority
- Moderate To High Priority
- Moderate Priority



Overall: Stacked Priorities

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

Goal: Cool

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

	PARCEL HAS PRIORITY ACRES	PRIORITY ACRES	PERCENT OF PARCEL
Daytime Heat Island Hot Spots	Yes	17.4	100%
Nighttime Heat Island Hot Spots	Yes	17.4	100%
Areas of High Impervious Surface	Yes	17.4	100%

This report was created on June 12, 2014 using the Climate Smart Cities: Healthy Connected Chattanooga site.
2014 The Trust for Public Land. TPL, The Trust for Public Land, and The Trust for Public Land logo are trademarks of The Trust for Public Land. <http://www.tpl.org>

Climate Smart Cities: Healthy Connected Chattanooga Parcel Report

Parcel ID: 136C B 001

Owner: CINCINNATI NEW ORLEANS & TEXAS

Acres: 26.0

Goal: Priority Connections and Adjacent Properties

PARCEL HAS PRIORITY ACRES: No
PRIORITY ACRES:
PERCENT OF PARCEL:

	PARCEL HAS PRIORITY ACRES	PRIORITY ACRES	PERCENT OF PARCEL
--	---------------------------	----------------	-------------------

Goal: Absorb and Protect

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

	PARCEL HAS PRIORITY ACRES	PRIORITY ACRES	PERCENT OF PARCEL
Estimated Runoff Volume	No		
Wetness Index	Yes	17.4	100%
Floodways and Flood Zones	Yes	17.4	100%
Stream Corridor Evaluation (SCORE) for Riparian Buffers	No		
Wetland and Pond Buffers	No		
Combined Sewer System Areas	No		
Illicit Discharge Potential (IDP) Scores by Subbasin	Yes	17.4	100%

Goal: Equitable Access and Health

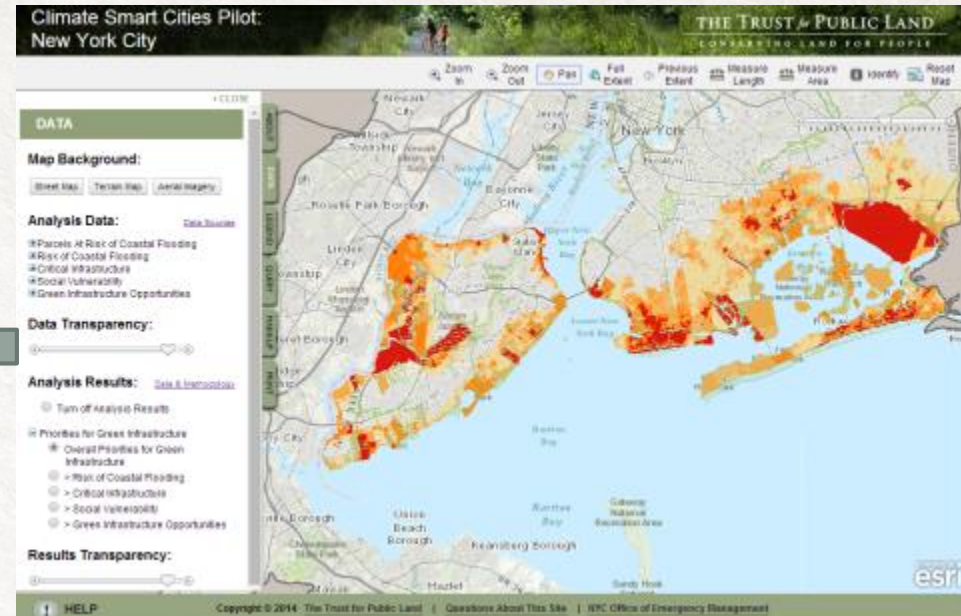
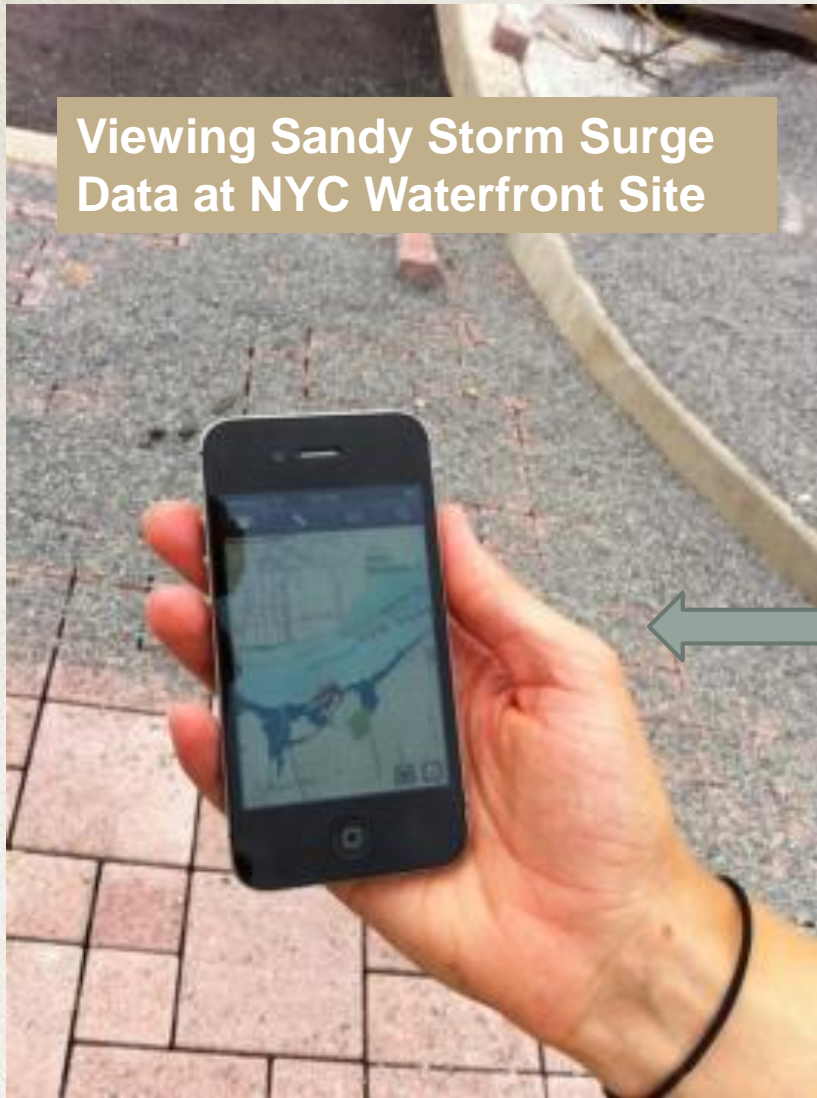
PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

	PARCEL HAS PRIORITY ACRES	PRIORITY ACRES	PERCENT OF PARCEL
% Obese Teens	Yes	17.4	100%
Likelihood of Obese or OverWeight Adults	Yes	17.4	100%
Likelihood of Adults not meeting Physical Activity	Yes	17.4	100%
Likelihood of Adult Disease	Yes	17.4	100%
Likelihood of Diabetes	Yes	17.4	100%
Likelihood of Suicide	No		
Likelihood of Respiratory Disease	Yes	17.4	100%
Likelihood of Stroke	Yes	17.4	100%
Population Density	No		
% Kids 19 and under	Yes	17.4	100%
% Seniors 65 and older	Yes	17.4	100%
% Low Income households	No		
Access to Recreation Facilities	Yes	17.4	100%

This report was created on June 12, 2014 using the Climate Smart Cities: Healthy Connected Chattanooga site.
2014 The Trust for Public Land. TPL, The Trust for Public Land, and The Trust for Public Land logo are trademarks of The Trust for Public Land. <http://www.tpl.org>

Funding: Show Rationale for Projects w/ 1-Click Parcel Reports

Viewing Sandy Storm Surge Data at NYC Waterfront Site



Being Online Means Users Can Take Data to the Field



**Green Infrastructure Playground
P.S. 261, Brooklyn**

