

The Nature of New York City

The Nature Conservancy at a Glance

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.

- Locations in all 50 U.S. states and over 35 countries
- More than 3,500 staff members
- 120 million acres protected
- 100+ marine projects
- 1 million members
- Cities are our newest, and a quickly growing, priority area

North America Cities Network



NYC Program Pillars

Coastal and Community
Resilience through
Natural Defenses

Environmental Quality of Life

New Leadership
for Urban Conservation



The Nature Conservancy NYC Projects

- Greenprint: Natural resource asset and potential mapping
- Songbird habitat restoration with National Park Service at Jamaica Bay Wildlife Refuge
- Urban coastal resilience – green/gray valuation
- Urban Heat Island with Mayor’s Office of Recovery and Resiliency
- Salt marsh condition and vulnerability indices with NYC Parks Natural Resources Group
- Public access design at Marine Park with Natural Areas Conservancy
- Healthy Harbor (partnership with Billion Oyster Project)
- Youth Leadership/LEAF Ambassadors
- Bag Fee Bill (Just passed City Council!)

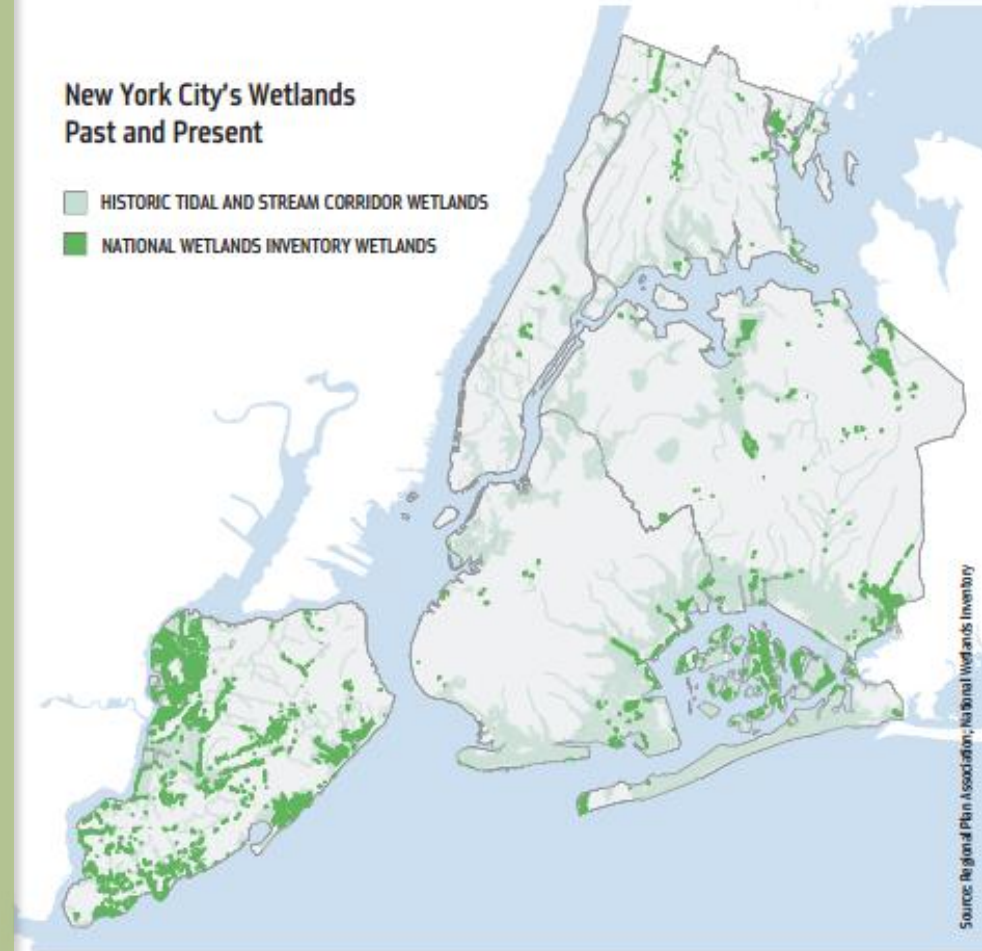
Greenprint Scoping



State of Natural Resources in NYC

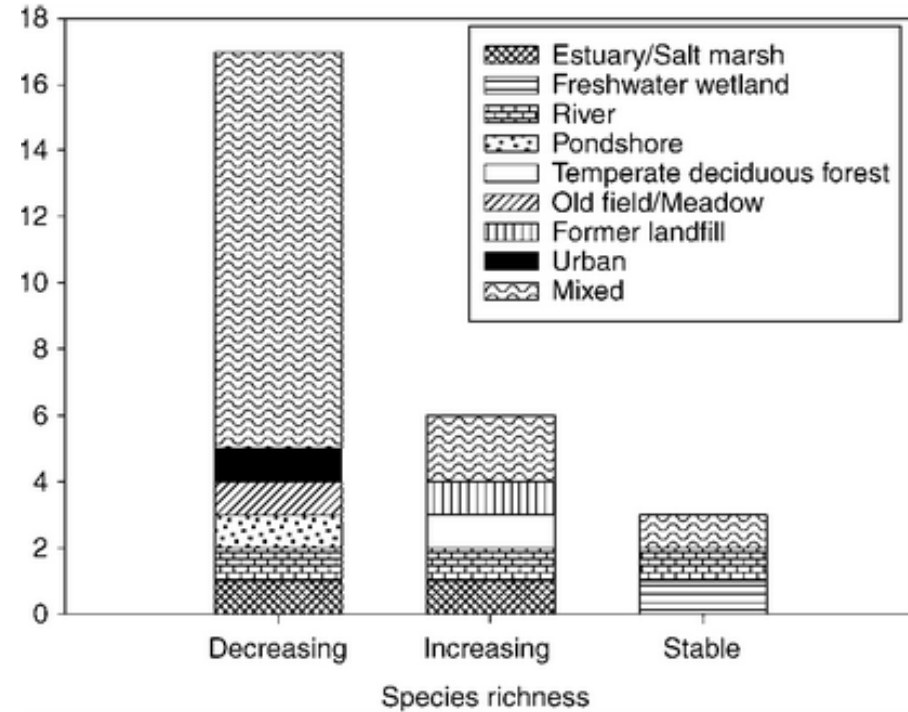
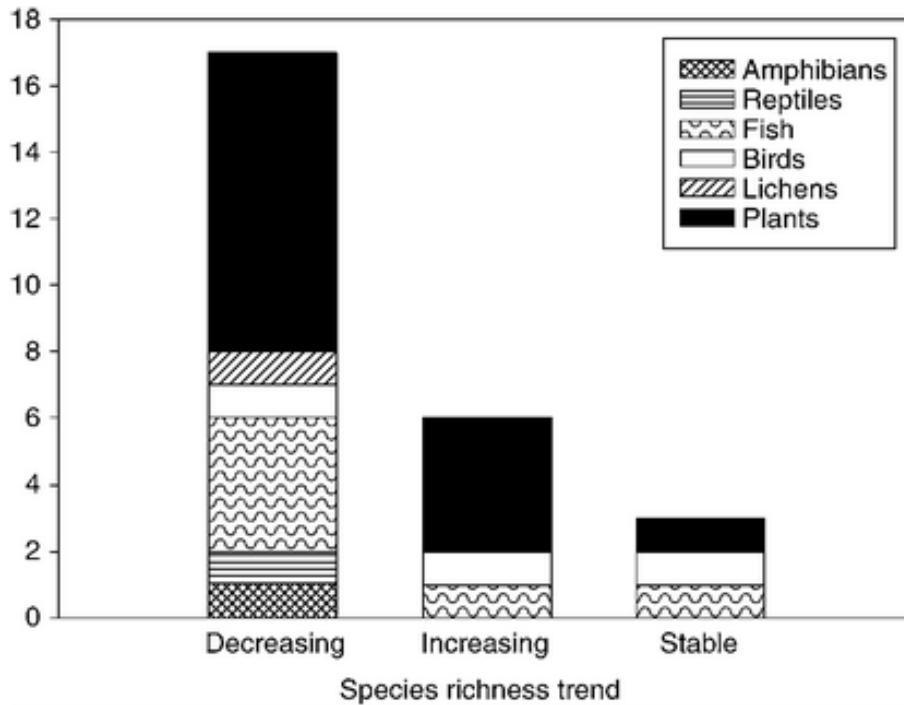
What we know:

- 85% of NYC benthic habitat and tidal wetlands have been lost in NY-NJ estuary (PlaNYC Wetlands Strategy 2012)
- 99% of NYC freshwater wetlands have been lost (PlaNYC Wetlands Strategy 2012)
- NYC tree canopy declined from 24% in 2001 to 21% in 2010 (O'Neil-Dunne 2012)

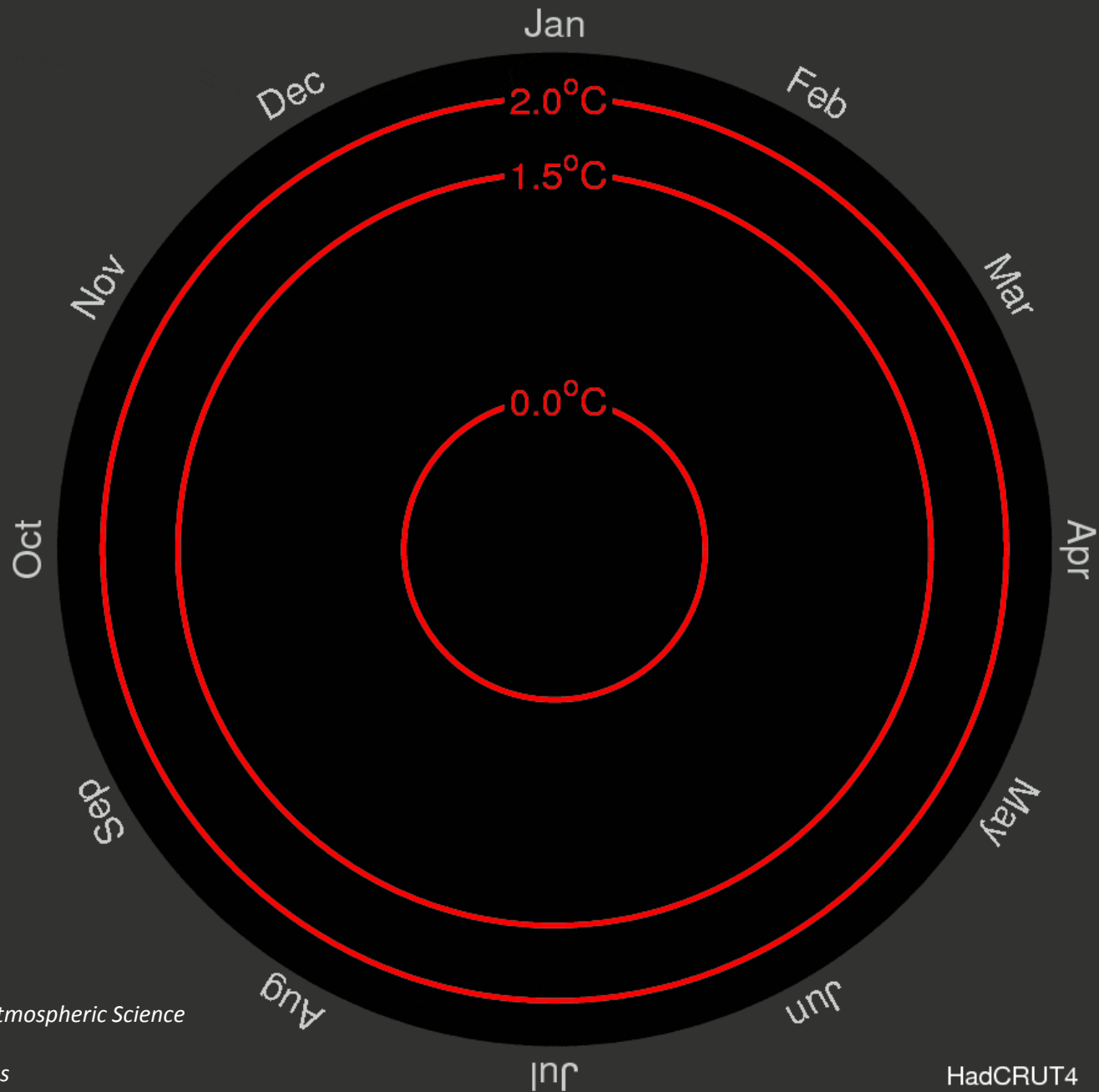


*Source: Regional Plan Association
National Wetlands Inventory*

Trends in Species Richness NYC Metro Area



Global temperature change (1850–2016)

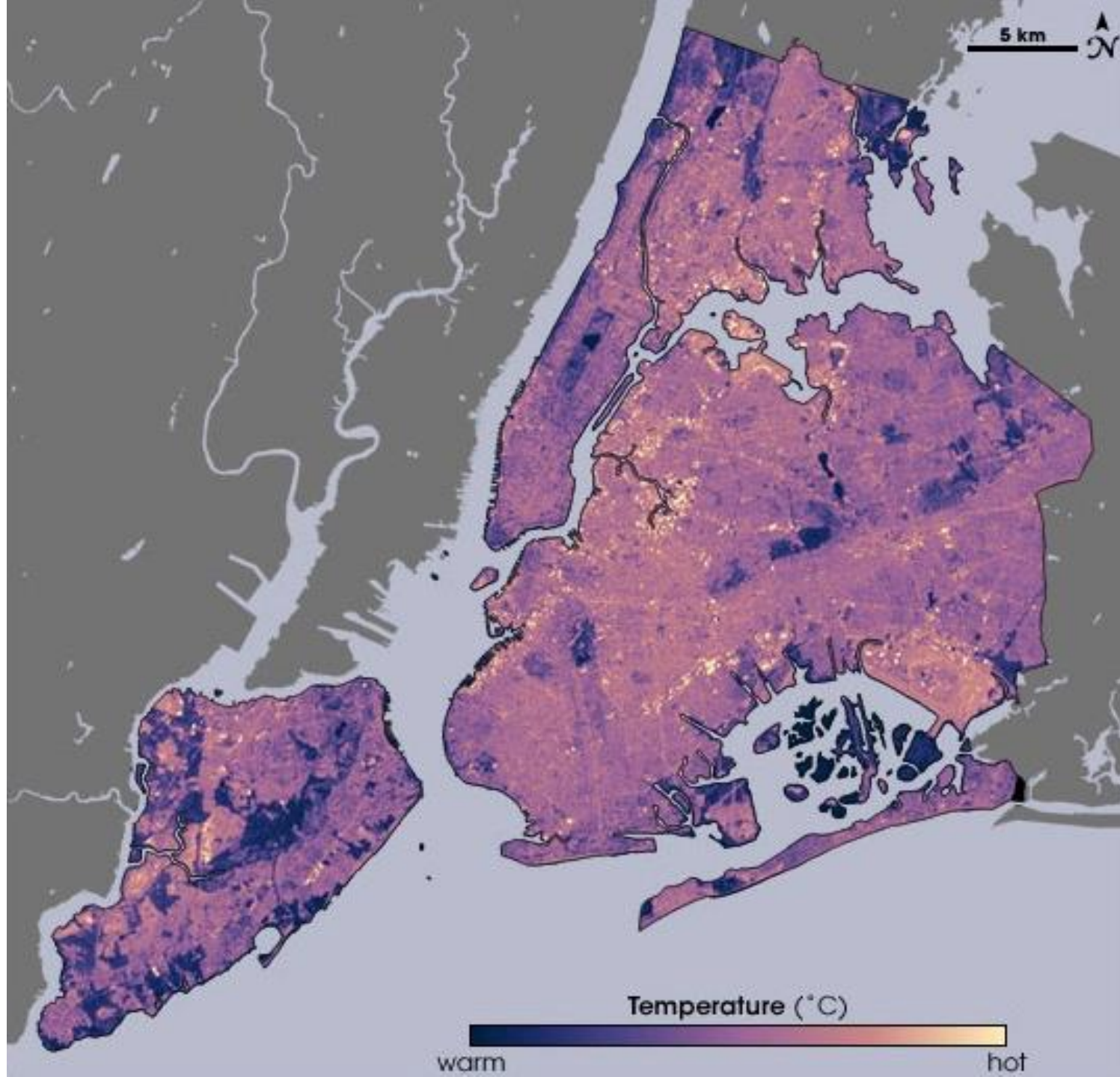


Source:
Ed Hawkins
National Centre for Atmospheric Science
University of Reading
Twitter: @ed_hawkins

HadCRUT4



Source:
© NASA 2006



Source:
© NASA 2006

State of Natural Resources in NYC

Some things we don't know:

- How are natural assets distributed
 - ▷ Across the 5 boroughs
 - ▷ Across city, federal, and private land owners
 - ▷ Across socioeconomic gradient
- Functional performance and full potential of natural assets including open space
- How do wildlife move throughout the city and what habitats do they use?
 - ▷ Migratory and resident animals
 - ▷ Pollinators and birds



Working groups, data and tools, oh my!

Example Working Groups

Urban Heat Island Working Group

Public access survey (HEP/USFS)

ReCAP/ Biodiversity working group

NYNJ Harbor and Estuary Program Restoration Working Group

Nature Goals 2050

Assets and Physical Conditions

Temperature

Green roofs

Urban forests

Open Space

Census

Cool roofs

Birds

Wetlands

Oysters

Historic ecology

Urban soils

Sea-level rise

Green Infrastructure

Sewage Drainage/CSOs

Biodiversity

Tools and Data Platforms

Storm H2O DEP map

OASIS

LivingLots NYC

Vision-Maker

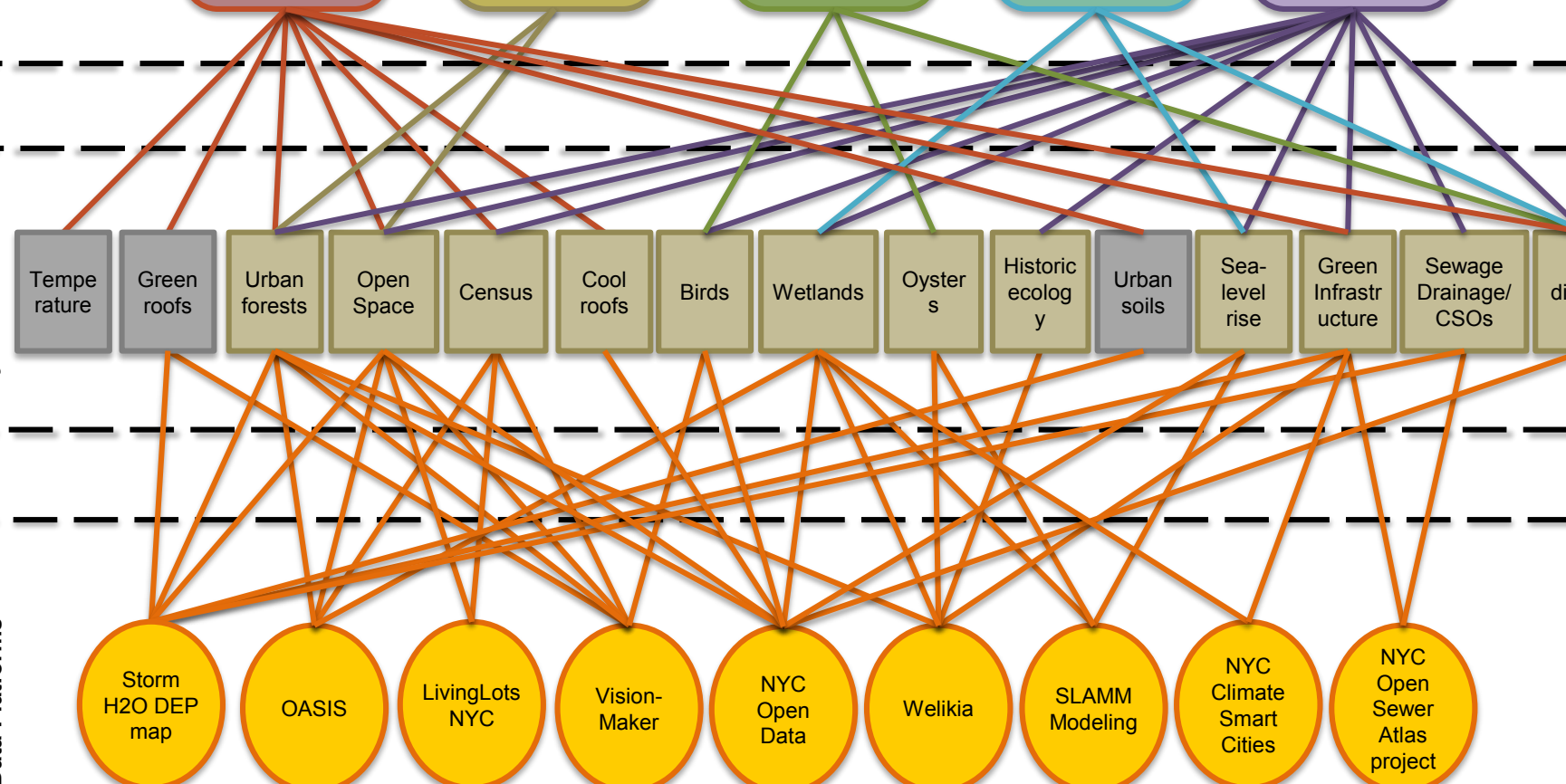
NYC Open Data

Welikia

SLAMM Modeling

NYC Climate Smart Cities

NYC Open Sewer Atlas project



How do we get the full picture of open space, open space potential and nature's benefits?

1. Literature review
2. Tools analysis
3. Stakeholder and thought leader survey and interviews
4. Sample Maps
5. *Final Report with Recommendations*

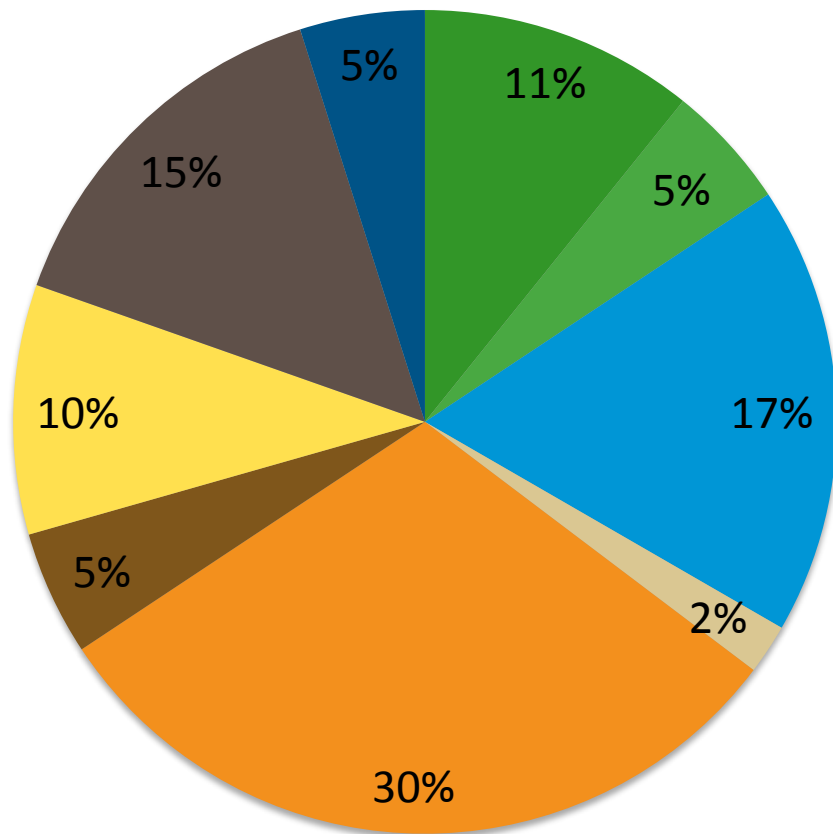


Surveying the Field

1. “What are the **needs and priorities** of the stakeholders managing or advocating natural resources in New York City?”
2. “Would a **mapping tool** be useful for the stakeholders in managing or advocating natural resources in New York City?”
3. “Are the stakeholders interested in **collaborating** with the Nature Conservancy on a mapping tool?”

Methodology

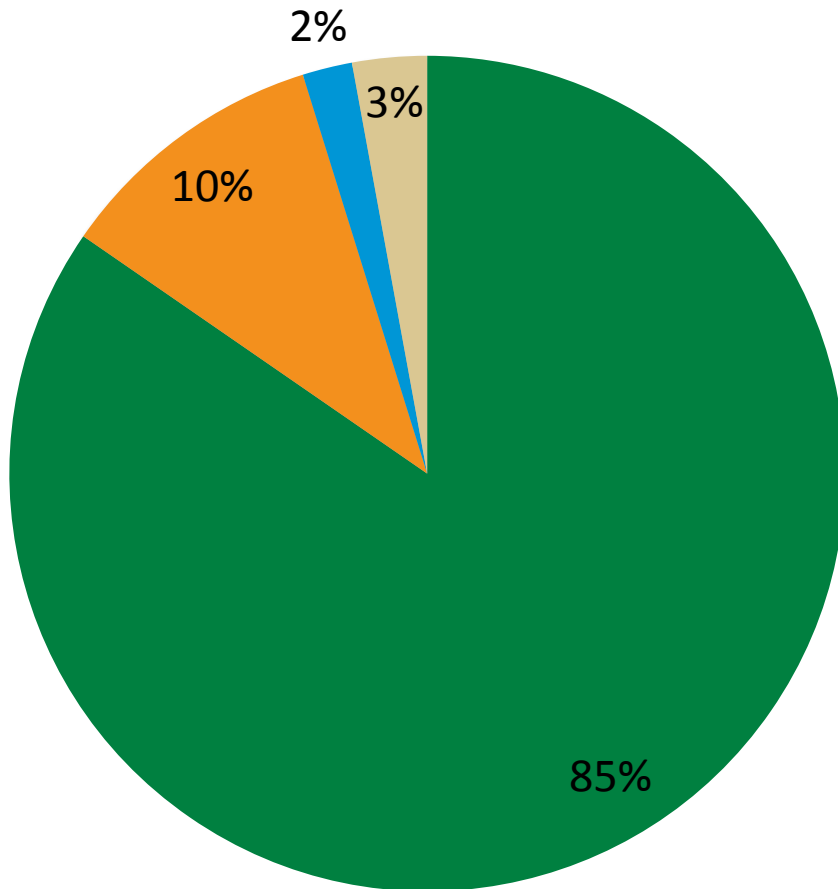
453 Organizations



- Apartment Grounds / Green Buildings
- Brownfields / Vacant Lots
- Community Gardens
- Forests
- Parks
- Social Equity
- Various
- Water
- Wildlife

Survey Results

108 Respondents
24% Response Rate



■ Non-Profit / Civic

■ Government

■ Academia

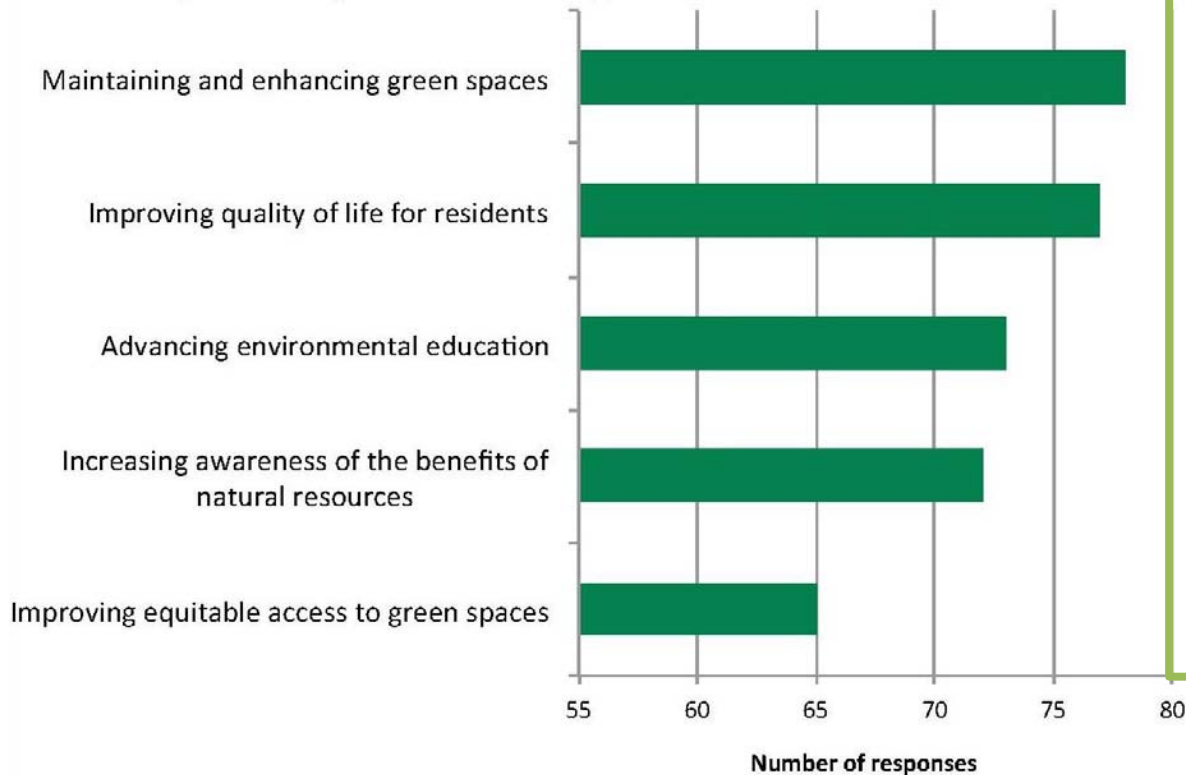
■ Private Firm

Major NYC government agencies responded, including:

- Dept. of Environmental Protection
- Dept. of Environmental Conservation
- Dept. of Parks and Recreation

Findings – Priorities and Needs

Important objectives of the organization's work in New York



Concerns

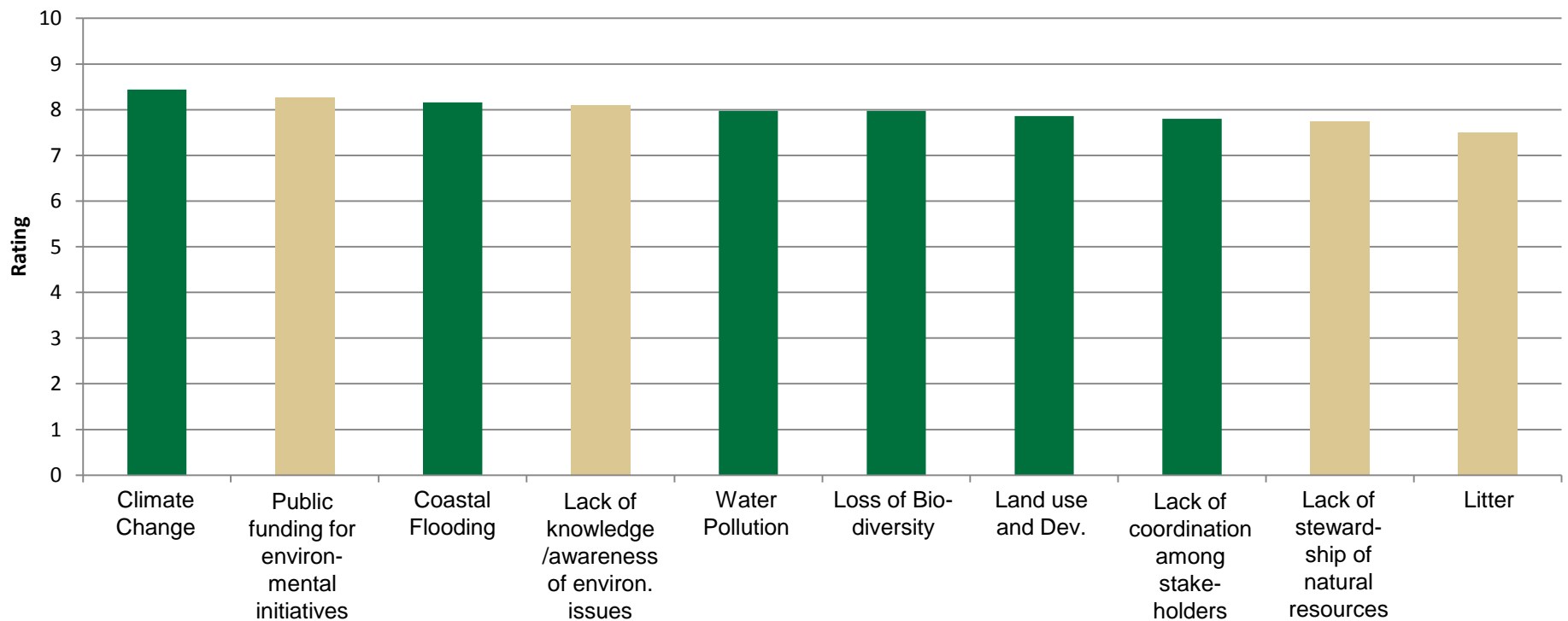
- Climate Change – 98%
- Public Funding – 97%

Important Capacities

- Government Support – 64%
- Public Awareness of Threats – 60%

Findings – Threats

Organizations' identified threats that may be addressed with the aid of a mapping tool



Key Themes from Interviews

People don't just want a "tool;" they want a process to build joint goals using spatial data and visualization.

- **Process** as important as tool itself
- We have work groups for (some) physical assets -- systems and species -- but less so for **services, benefits and functions**
- We generally lack **functional goals for ecosystems and open space** (stormwater management being the notable exception)
- May need consensus around drivers of habitat, function or system loss to set strategies

Scale

Scenarios for neighborhood “green portfolios” are needed

- Community board
- Watershed
- Neighborhood
- Council District
- Citywide: Map Nature Goals 2050 priorities

Beyond NYC Borders: Regional “serviceshed” approach

- Watershed: DEP
- Foodshed: <http://nycfoodpolicy.org> (CUNY)
- Habitat connectivity
- Other?

Cross-Cutting Thematic Priorities

A woman with dark hair tied back, wearing a green t-shirt and dark pants, is kneeling in a field of young trees. She is wearing gloves and is in the process of planting a sapling into the ground. A black plastic nursery pot is on the ground next to her. The background shows other trees and a person in a red shirt working in the distance. The scene is outdoors with natural lighting.

- Climate change projections
- Asset quantity and quality
- Valuation/economics
- Equity and Justice (distributional and access issues)
- Demonstrating environment-health connections
- Ecological democracy (for visioning/scenario development)
- Environmental literacy

Functional Priorities

A photograph of a person wearing an orange life vest and a dark shirt, working on a boat. They are handling a large, cylindrical net filled with seaweed or marine life. The background shows a body of water and a city skyline in the distance. The image is overlaid with a semi-transparent green box containing text.

- Biodiversity and habitat**
- **Coastal protection/resilience****
- Water quality**
- **Connectivity****
- Inspiration**
- Pollination
- **Heat mitigation**
- Air Quality
- Drinking water
- Greenhouse gas reduction
- Green employment
- Access
- Quality of life

**Bold items are current Nature Conservancy research efforts*

***Nature Goals 2050 Priorities (developed by Natural Areas Conservancy Advisory Board)*

Asset/Physical Condition Mapping

****Major Gaps****

- **Rooftops: existing and potential**
- Benthic/bathymetric conditions (new data/make existing data accessible)
- Wetlands (freshwater especially)
- Biodiversity
 - **Pollinators**
- Ambient temperature
- Privately owned open or underperforming space (e.g. backyards and driveways)

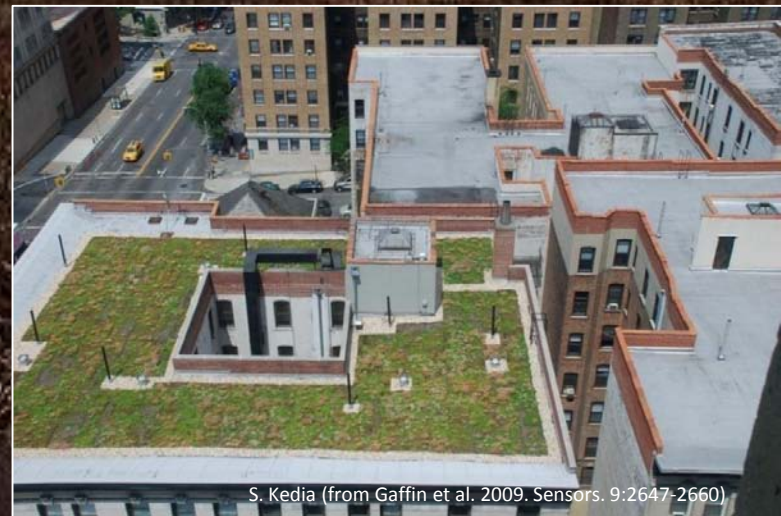
**Bold items are current Nature Conservancy research efforts*

What are Green Roofs?

Roofs with vegetation integrated through design and construction



Mike Treglia



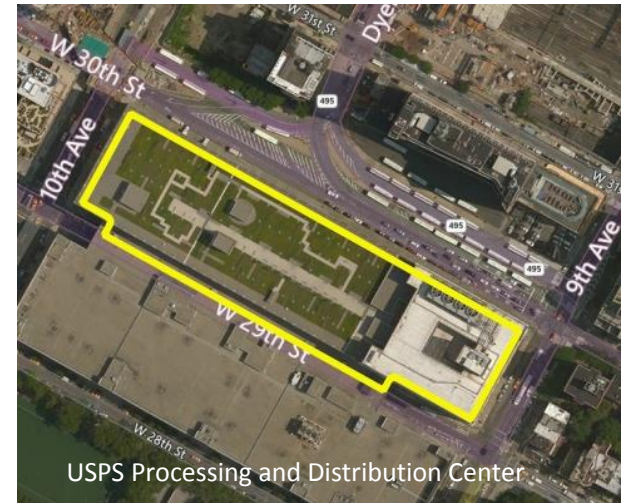
S. Kedia (from Gaffin et al. 2009. Sensors. 9:2647-2660)

Characterizing open space potential above our heads: green roof asset mapping

- Identify buildings with considerable rooftop vegetation
- First attempt/feasibility assessment
- Create efficient, automated and replicable methodology

Preliminary Results

Successful Classification of Green Roofs



Preliminary Results

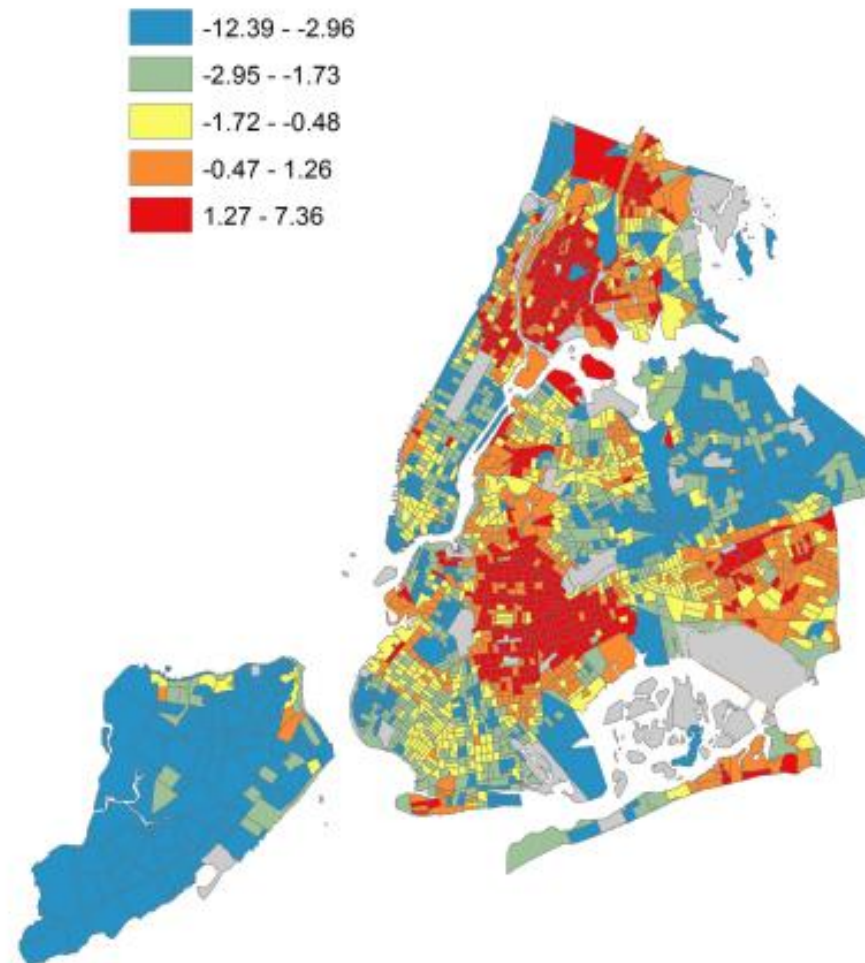
- Takes ~20 Minutes to Run For Entire City
 - ~2 Billion Pixels & 1 Million Buildings
- High Commission Error
 - Incorrectly Classifying Roofs as Green Roofs
- Need to Evaluate Omission Error



Imagining a Functional Platform: *Cool Corridors Project*

Collaboration with Department of Health and Mental Hygiene

Composite Vulnerability Index



Greenprint Scope Next Steps

- **Synthesize final interview responses**
- **Complete sample mapping (connectivity and roofs)**
- **Issue final report**
- **Continue aggregating data data layers to provide full picture of NYC open space and open space potential**
- **Develop process, data standards and potentially shared platform for improved coordination and collaboration**

A scenic view of a wetland area. In the foreground, there's a body of water with several wooden pilings protruding from it. Ducks are swimming in the water. In the background, there's a field of tall reeds or grasses under a clear sky.

Thank you!

Emily Nobel Maxwell

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The Nature Conservancy in New York

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