Urban Field Station Starter Kit

Tools, Datasets, and Resources to
Improve Natural Resource Management and Outcomes

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April, 2018

Today's Objective

The U.S. Forest Service has many tools, datasets, and resources that can substantially improve outcomes for urban natural resource management and stewardship. **Our objective is to better understand and know when and how to apply these tools to achieve desired outcomes.**

Tools:

- STEW-MAP - Stewardship group inventory **(social data + GIS + network mapping tool)**
- Urban Tree Canopy Assessment (UTC) - high-resolution landcover inventory (**biophysical mapping tool**)
- i-Tree – tree cover and benefits tool (**ecosystem services tool)**

Dataset:

- Urban FIA – field-based inventory (**urban forest inventory dataset**)

Resources:

- Vibrant Cities Lab – research, resources, and guide for putting trees to work in a community **(urban forestry information clearinghouse)**
- Climate Change Resource Center – research, resources, and guide about climate change effects on forests **(climate change & forestry info clearinghouse)**

These tools can be used separately; some are especially powerful when combined; but first, we lead with the WHY?

Agenda

- **Intro** to the U.S. Forest Service Urban Field Stations
- **Desired outcomes**
- **STEW-MAP 101**
- **Urban Tree Canopy (UTC) 101**
- **i-Tree**
- **Urban FIA**
- **Vibrant Cities Lab**
- **Climate Change Resource Center**
- **Discuss**: Want to learn more? How could these tools be used in your city or geography of interest?

Intro

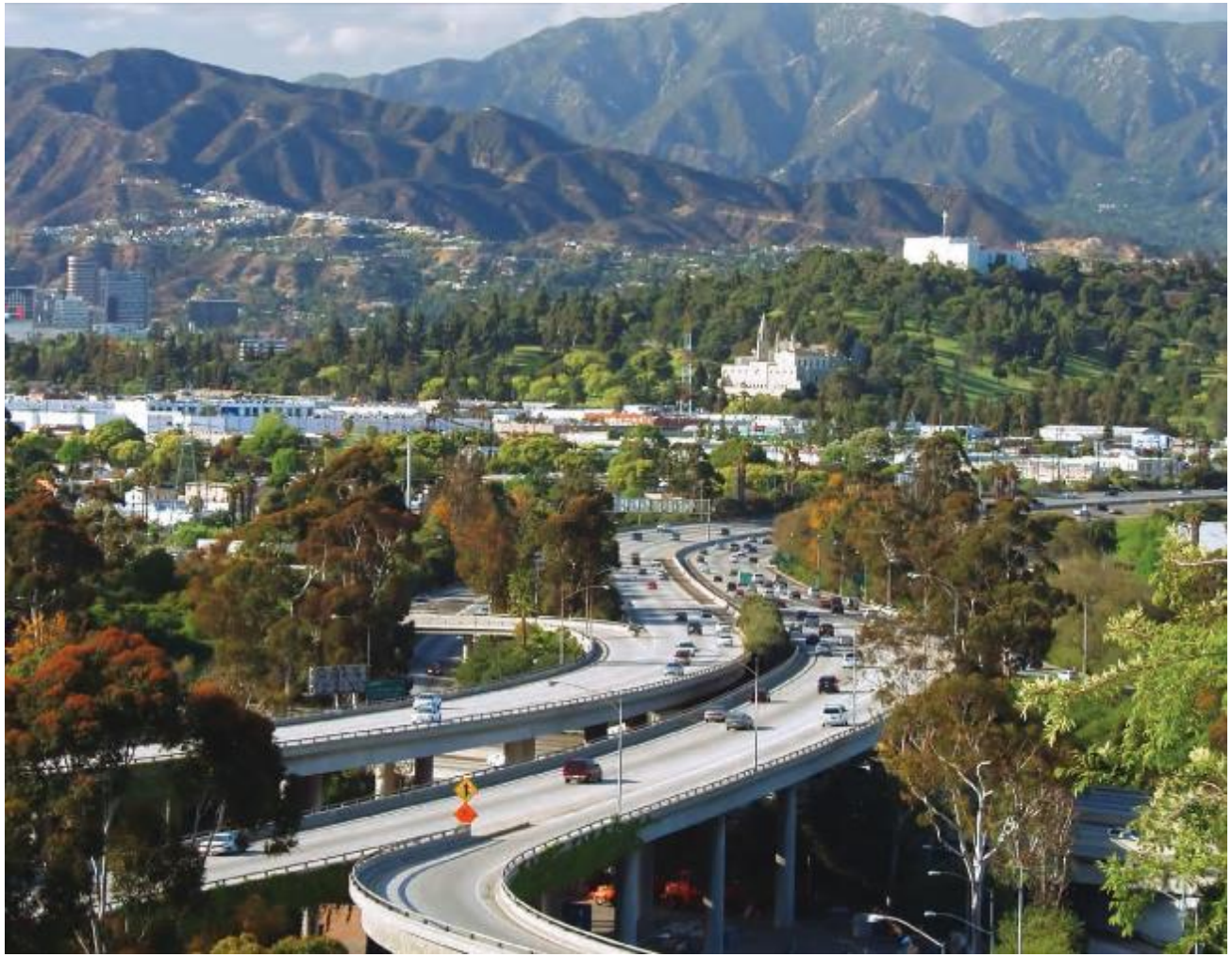
US Forest Service Urban Field Stations

- Locations:
  - Baltimore, Chicago, New York City, Philadelphia, San Juan, Los Angeles (established)
  - Denver, Seattle (developing)
- We work across disciplines and with local partners to provide **place-based, client-focused, actionable research** on urban ecosystems and people.

Locally driven | broadly applied

Why have Urban Field Stations?

- Invest in a **place** and a **network**
- Urban forests have outsized influence
- Science-based decision making
- Extend the **mission** and **relevance** of the Forest Service.



Desired Outcomes

Desired Outcomes

How do we improve quality of life for all city residents through efficient & effective natural resource management? Consider…

- Water quality
- Air quality
- Urban heat island
- Biodiversity
- Access to and use of green space
- Walkability
- Public health & disease
- Crime
- Quality of life

"…[I]t is a mere matter of common sense to recognize that the State, the community, the citizens acting together, can do a number of things better than if they were left to individual action." - Teddy Roosevelt

What tools, resources, and datasets can help us reach our desired outcomes?

Tools:

- STEW-MAP - Stewardship group inventory **(social data + GIS + network mapping tool)**
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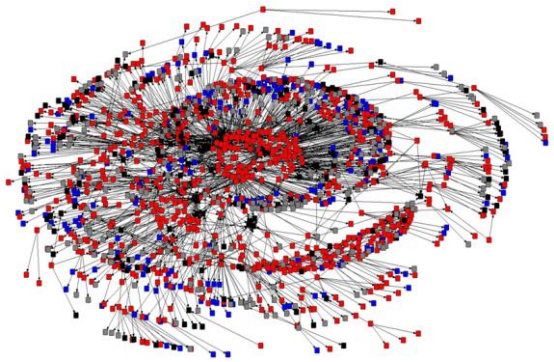
Power Pairings

- STEW-MAP and UTC
- Urban FIA and i-Tree

Power Pairings: STEW-MAP & UTC

Stew-Map



- Stewardship group inventory **(social data + GIS + network mapping tool)**
- STEW-MAP inherently promotes coordination, collaboration, and synergies among organizations

Urban Tree Canopy (UTC)

- Landcover inventory (**biophysical mapping tool**)
- UTC can help improve the extent of tree cover by conserving existing trees and planting new ones – trees promote social, economic, and environmental benefits

Question:

What do you get when you combine a stewardship group inventory + landcover inventory?

Answer: Knowing who is working in a city and what are the assets ***improves outcomes for endless applications***:

- Stream cleanups
- Community gardening
- Urban agriculture
- Tree planting
- Vacant lot transformation
- Park maintenance & planning
- Disaster preparedness and recovery
- What are YOUR interests?

Why do stewardship group and landcover inventories?

1. Assess: current conditions
2. Plan: strategic and tactical implementation
3. Monitor & Evaluate: change over time

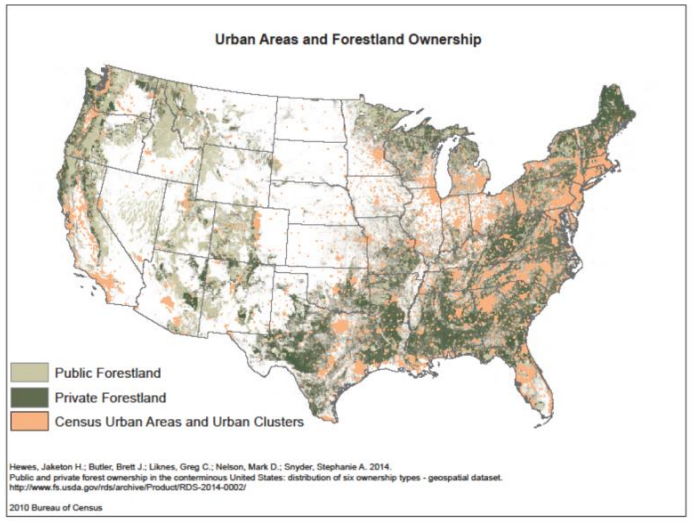
Why do stewardship group and landcover inventories?

	STEW-MAP	Urban Tree Canopy (UTC)
Assess	• SOCIAL: What are organizational capacities and characteristics? • SPATIAL: What are the connections to and among places? • NETWORKS: What are the connections among organizations & across sectors?	• Where do we currently have trees (and other green infrastructure)? • Where could we have trees (and other green infrastructure)?
Plan	• Helps identify what organizations to engage to achieve certain goals	• Helps prioritize where to conserve and restore tree canopy
Monitor & Evaluate	• What has been the effect of engaging certain organizations, or promoting coordination over time?	• What are the trends in tree canopy cover in a city and why?

*Combining information from STEW-MAP and UTC enables organizations to be far more **efficient**, **effective,** and **equitable**. For example, one might plan activities where there's existing capacity, or employ influential organizations to spread important messages.*

Power Pairings: Urban FIA & i-Tree

Urban FIA



- Urban FIA – field-based inventory (**urban forest inventory dataset**)
- A strategic level long-term annualized inventory and monitoring system on public and private lands to support both public and private management of the nation's urban forests

i-Tree

- i-Tree – tree cover and benefits tool (**ecosystem services tool)**
- Designed to assess the benefits and values derived from trees and forests to aid in improving forest management

Question:

What do you get when you combine a Urban FIA and i-Tree?

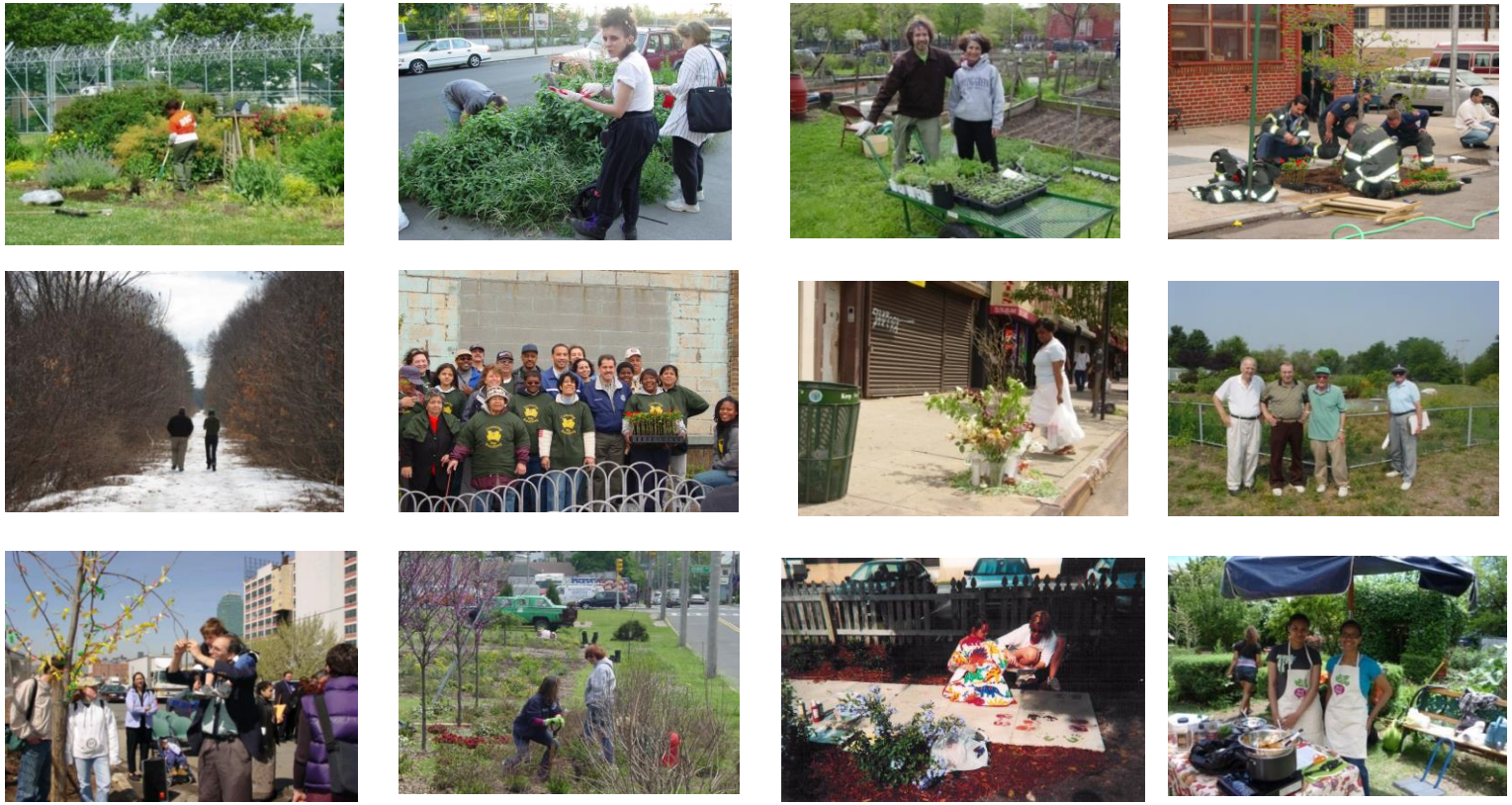
Urban FIA alone is very valuable:

- Regional and national trends in urban forests
- Build diversified wood economies
- Evaluate impacts of disturbances
- Strategic, national urban forest inventory across urban-rural gradient to help manage public and private forests

- Add i-Tree to generate benefits information

STEW-MAP 101

Defining environmental stewardship



Urban environmental stewards conserve, manage, monitor, transform, advocate for, or educate the public about the local environment (Svendsen and Campbell 2008; Fisher et al. 2012).

Why STEW-MAP?

- STEW-MAP is a **data-driven set of tools** for natural resource managers, funders, policymakers, educators, stewardship groups, and the public.

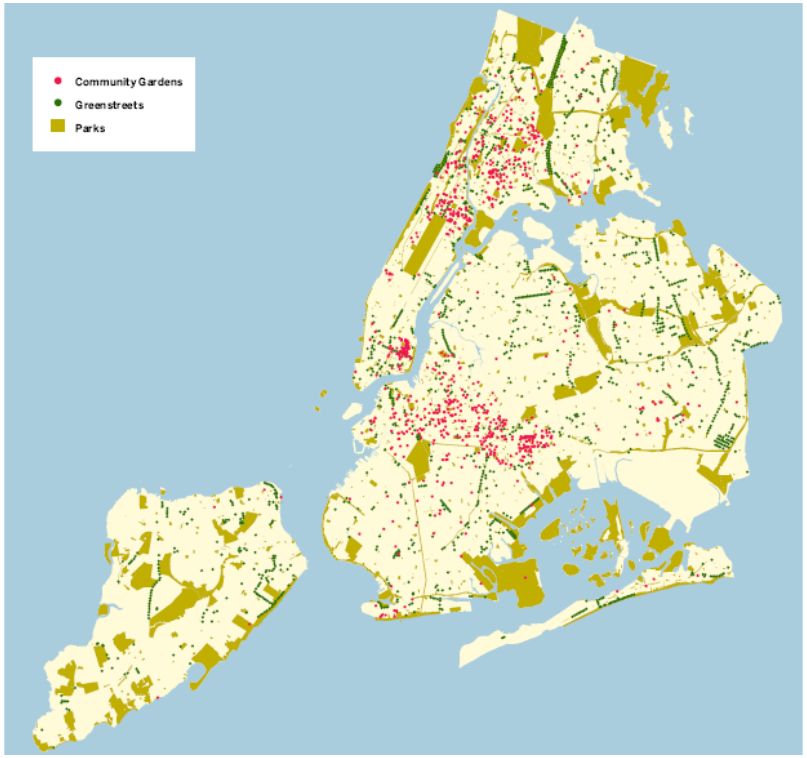
- STEW-MAP highlights existing stewardship **gaps and overlaps** in order to strengthen **capacities**, enhance promote broader **civic engagement** with on-the-ground environmental projects, and build effective partnerships among stakeholders involved in urban sustainability.

- A **growing number of cities** are conducting STEW-MAP – seek to understand the system of stewardship **across space and over time.**

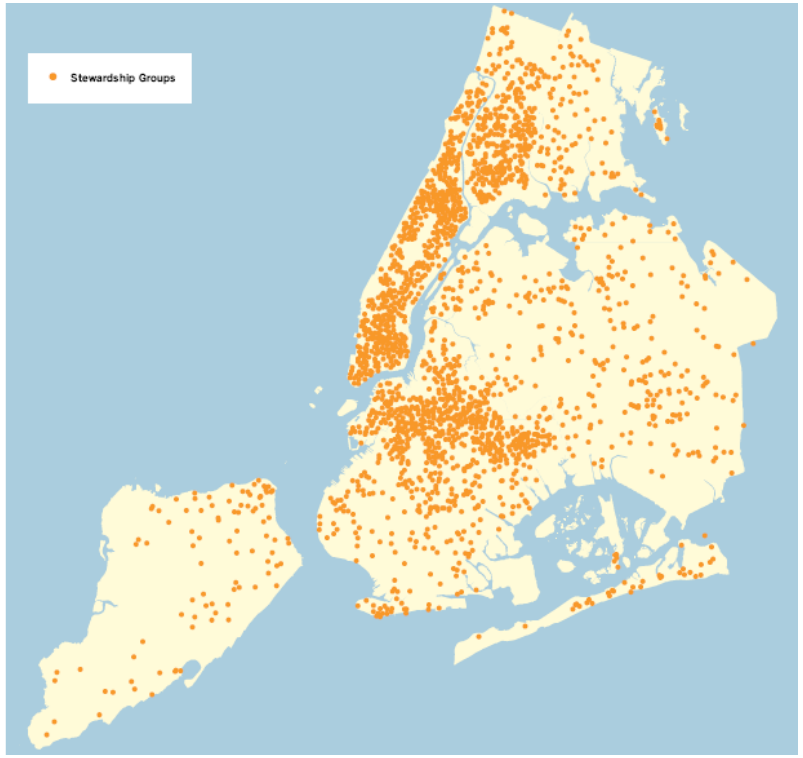
STEW-MAP:

Mapping green infrastructure and social infrastructure

Green Infrastructure



Social Infrastructure



Source: STEW-MAP 2007, New York City

STEW-MAP is applied science

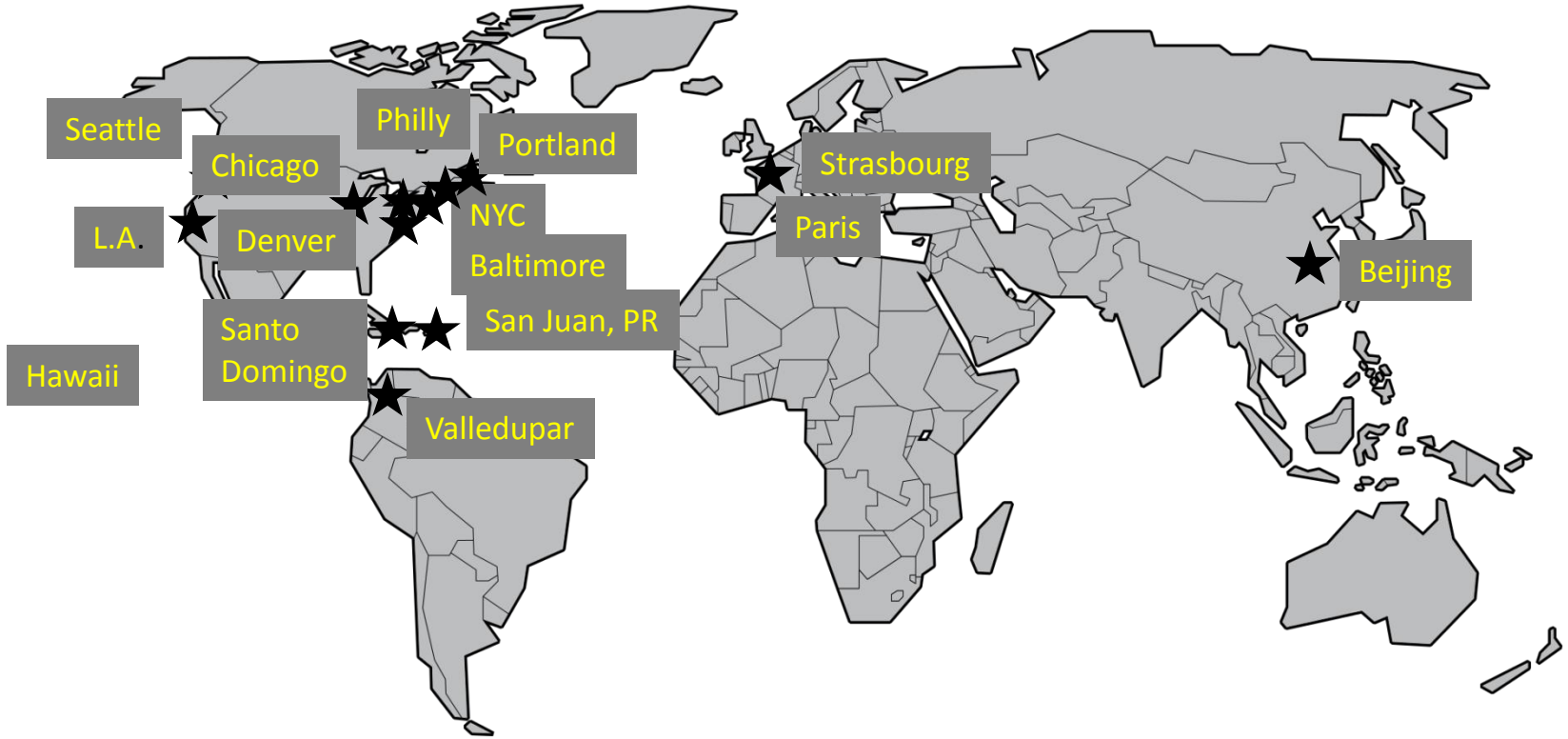
Research question

- How do we understand the social, spatial, and temporal interactions among actors working on stewardship in the city?
- *In other words: Who takes care of this city, why, how, and where?*

Practical uses & benefits

- Agencies and large NGOs – outreach and networking
- Funders – needs assessment and equity planning
- Design firms – understand stakeholders to create inclusive designs
- Neighborhood groups and individuals – identify local partners
- Social scientists– advancing theory and methodology of stewardship
- Systems scientists - social dataset in concert with other disciplines
- Students – understand stewardship and resilience

STEW-MAP locations



What can you learn from STEW-MAP?

- Organizational characteristics
- Geography or turf (GIS)
- Social networks (SNA)

STEW-MAP:
The Citywide Stewardship Census

STEW-MAP Social Applications:

Understanding civic capacity (example: New York City)

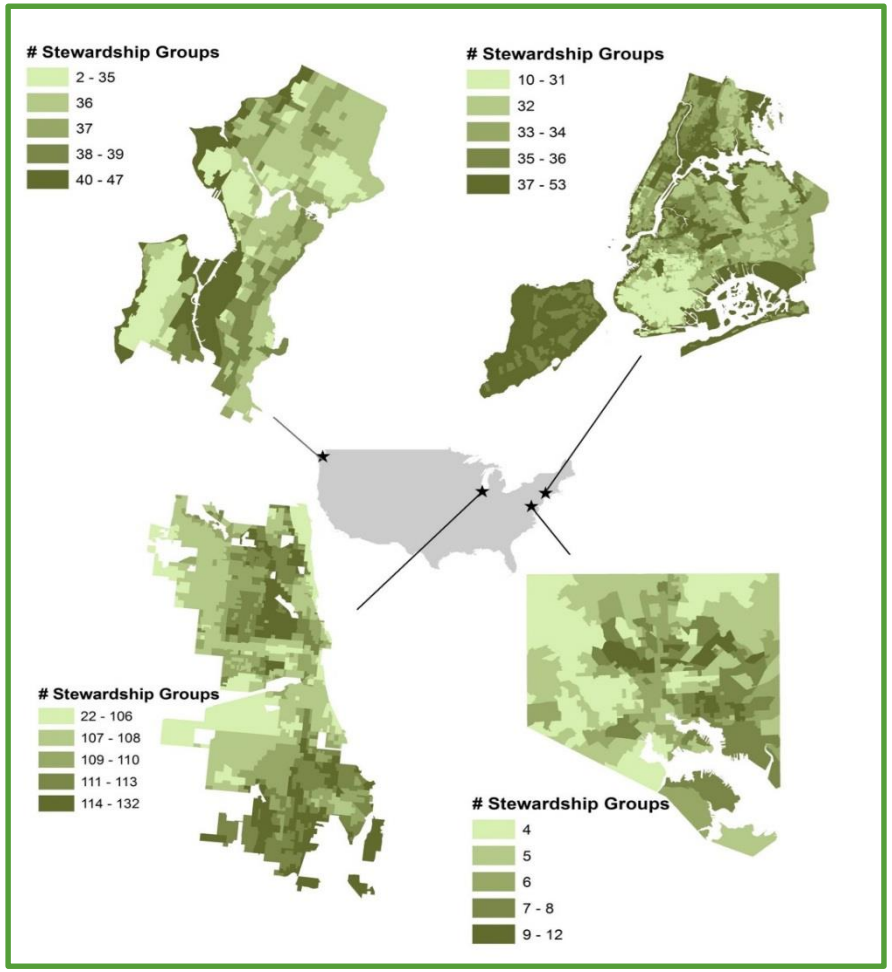
Characteristics	2007 Results
Year founded	Oldest formed in 1838, # orgs increased in 70s, 80s, 90s
Number of staff and volunteers	1/3 of groups had 0-1 paid staff
Budget	32% had budgets <$1,000
Fiscal status	½ civic groups had 501c3 status
Stewarded site types	Most common were parks, community gardens, and street trees
Primary focus	Top 3 were Environment, Community Improvement, and Education but many others
Services offered by groups	Top 3 were community organizing, outreach, and labor (volunteers/interns)

Fisher, D. R., Campbell, L. K., & Svendsen, E. S. (2012). *Environmental Politics*, *21*(1), 26-48.

STEW-MAP Spatial Applications:

Visualizing turf and intensity of civic practices

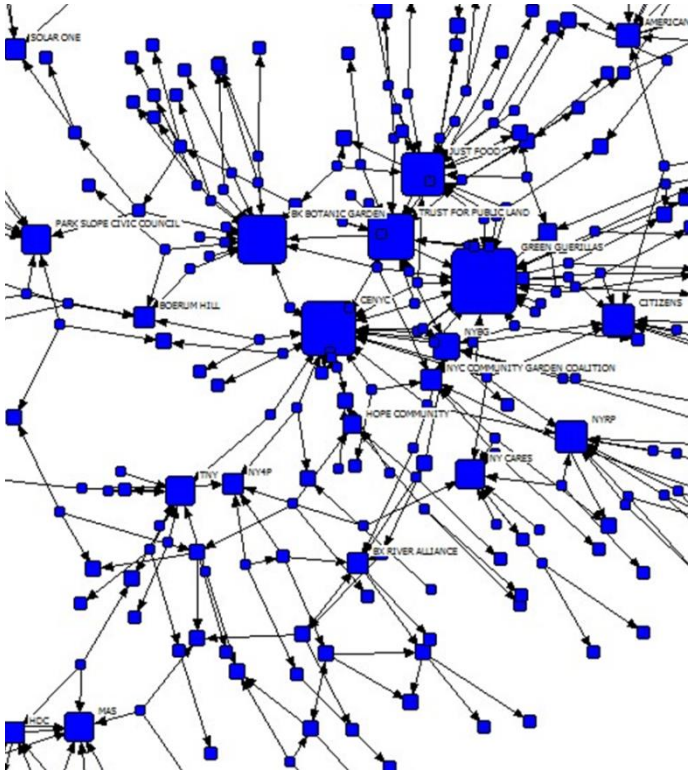
- Areas with lots of groups?
- Areas with few groups?
- Are there any gaps?
- What explains the spatial pattern at multiple scales?



(Johnson et al. in prep; STEW-MAP Seattle NYC, Baltimore, Chicago)

STEW-MAP Network Applications:

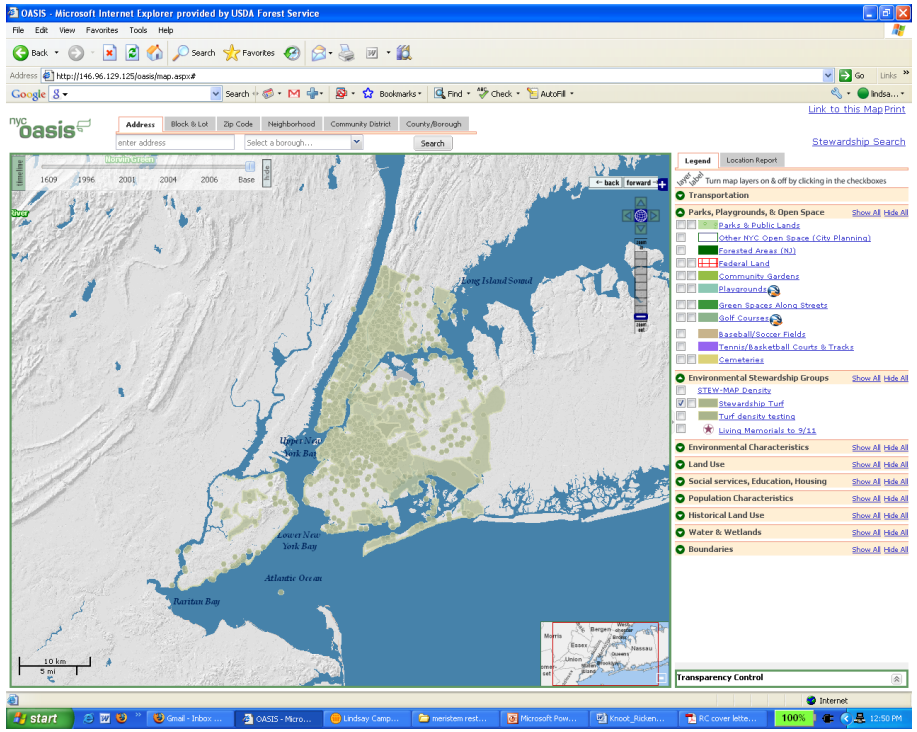
Supporting social networks and identifying civic brokers



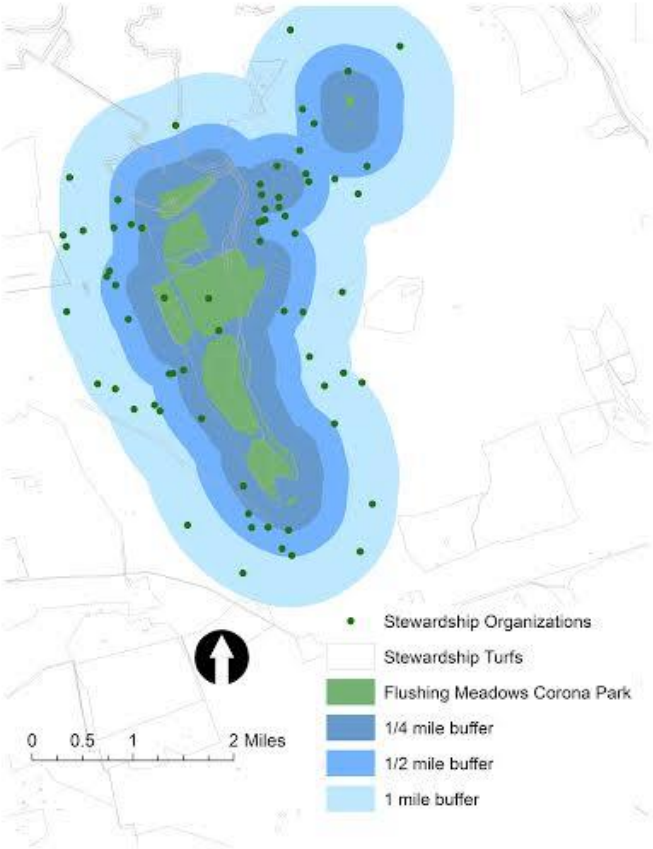
Connolly, J. J., Svendsen, E. S., Fisher, D. R., & Campbell, L. K. (2013). *Landscape and Urban Planning*, *109*(1), 76-84.

STEW-MAP Tools & Applications:

GIS to inform stewardship for the public and land managers



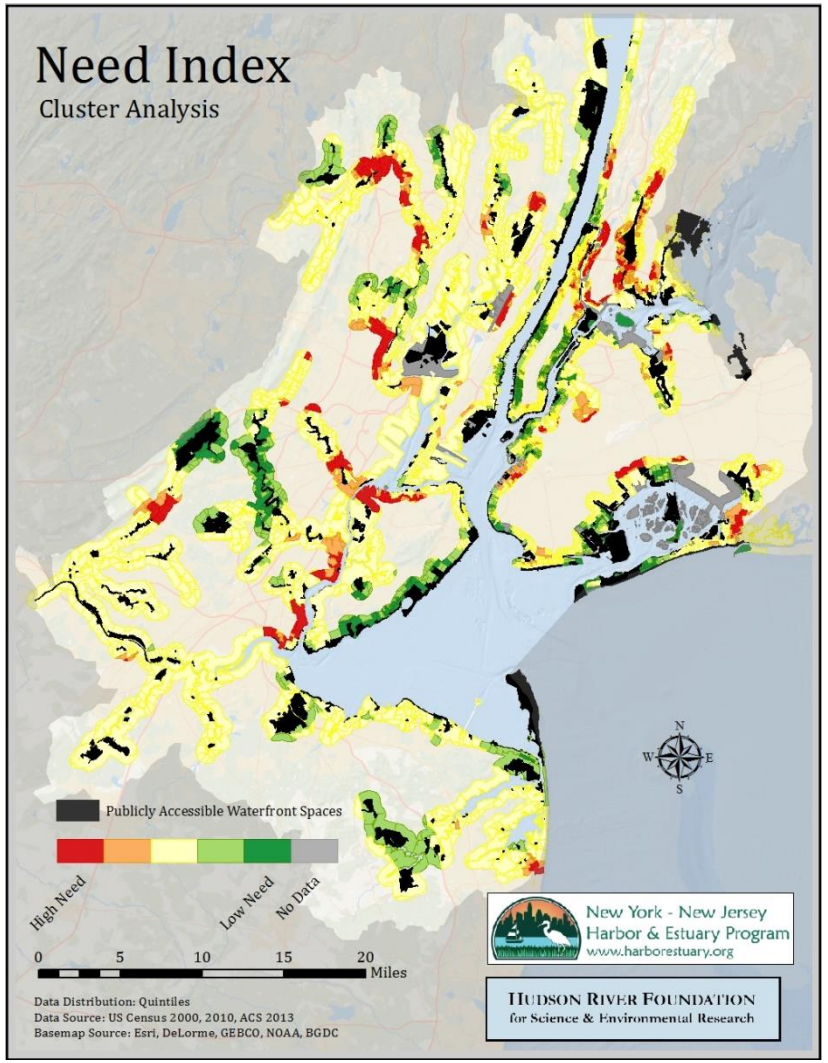
OASIS: Public GIS website

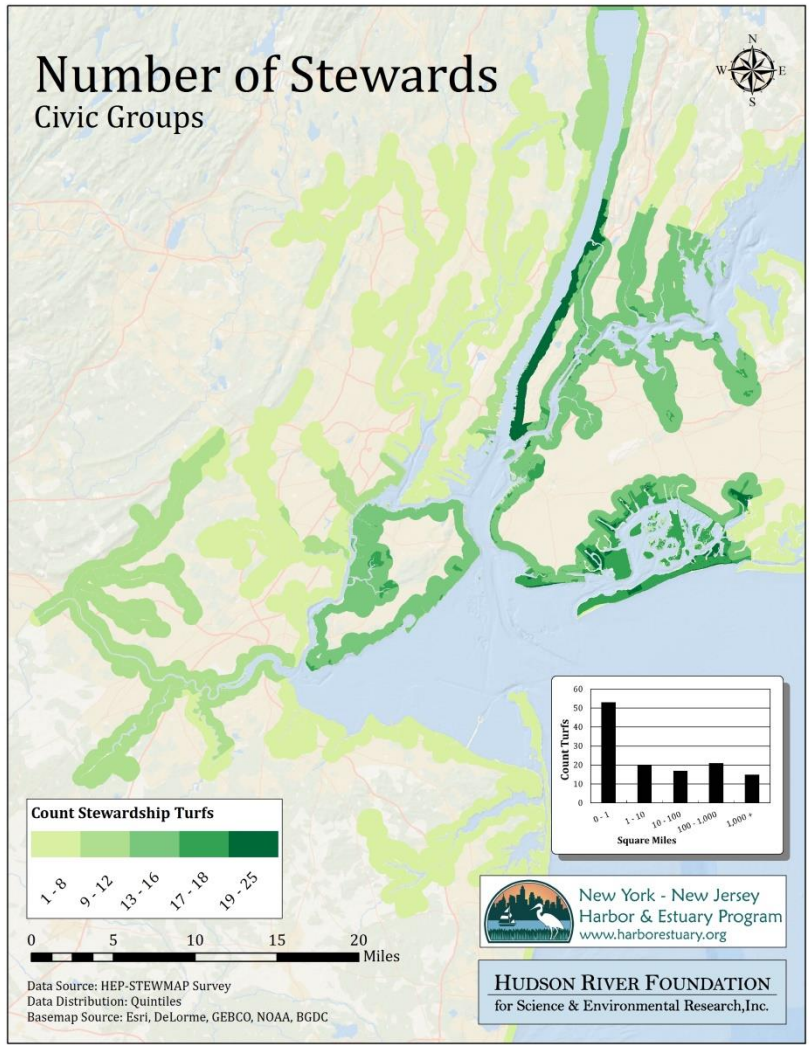


Custom data query for managers

STEW-MAP Partnerships & Applications:

Evaluation to support waterfront stewardship

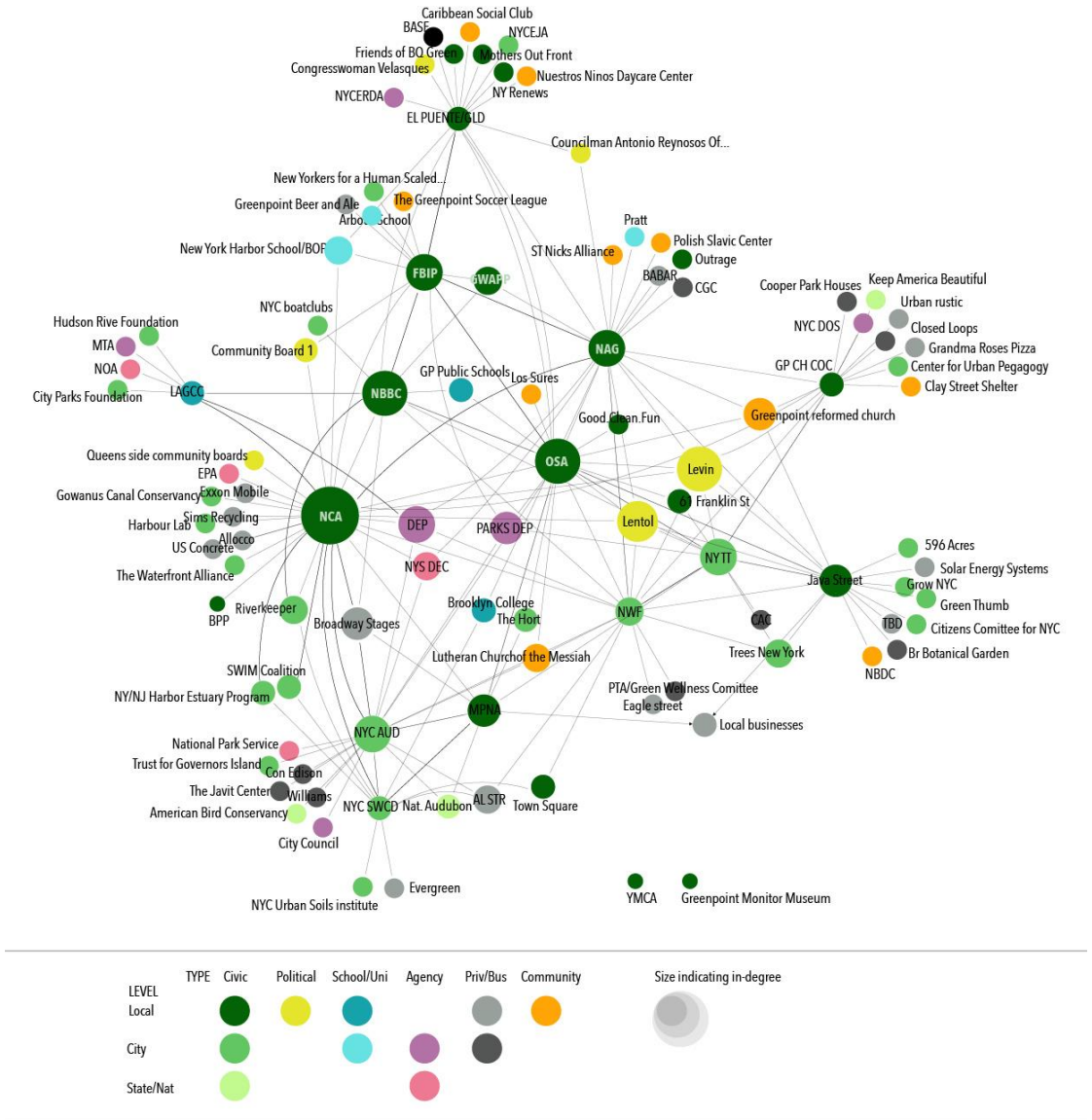




NY-NJ Harbor Estuary Program Need index (left) and stewardship density (right) – clipped to ¼ mile buffer from water
Source: https://www.nrs.fs.fed.us/pubs/50713

STEW-MAP Adaptations:

Research to understand stewardship at the neighborhood scale



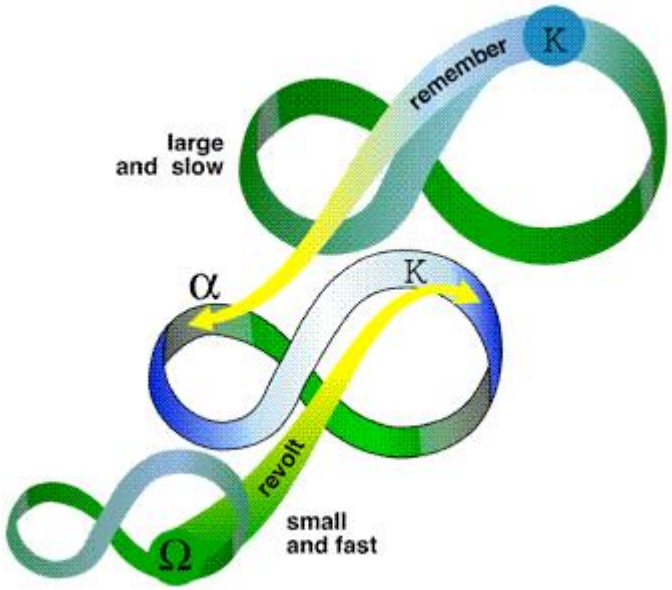
Network of stewardship groups in Greenpoint, Brooklyn.

Source: Boman, Johanna. 2017. “Environmental Stewardship Nurturing urban environmental stewardship – a case study of Greenpoint, Brooklyn New York.” Masters Thesis. Stockholm Resilience Centre, Stockholm University, 71pps.

STEW-MAP Temporal Applications:

Understand change over time in stewardship structure and function

- Adaptation to natural and social disturbances
- Response to government planning initiatives
- Professionalization and capacity building
- Innovation diffusion through networks and across space



Urban Tree Canopy (UTC) 101

Why Urban Tree Canopy (UTC) Assessment?

- UTC is a **data-driven set of tools that provides a complete census of all land in a city.** It can be used by natural resource managers, government agencies and policymakers, non-profits, stewardship groups, and the public.

- UTC **improves the extent of tree cover** by informing the conservation of existing trees and the planting of new trees.
  - Trees are important in cities for their myriad social, economic, environmental benefits.

- A **growing number of cities** are conducting UTC Assessments – seek to understand tree canopy, green infrastructure, and other landcover **across space and over time.**

UTC is applied science

Research question

- What is the spatial and temporal tree canopy across a landscape; how do we understand the social, spatial, and temporal drivers of tree canopy cover change?
- *In other words: Where do we have trees and where could we have trees?*

Practical uses & benefits

- Reveals the mosaic of land uses and management across a landscape
- Informs the adoption of practices for land conservation and restoration
- Informs outreach efforts for increasing tree canopy – knowing where opportunities are greatest, and who owns the land.
- Informs targeted plantings, prioritization, awareness, environmental justice, stewardship, regulatory compliance, goal setting, etc.

UTC does not replace field-based data

- UTC cannot provide information on DBH, species, ecosystem services, or condition.

UTC applications at multiple scales

Parcel

Census

Neighborhood

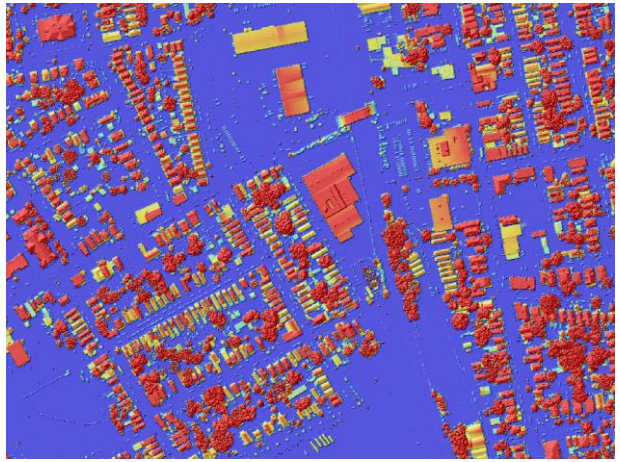
City

Watershed

What is UTC?

High resolution landcover imagery

+



LiDAR (light dectection and ranging)

=

Urban Tree Canopy (UTC) Assessment

UTC Applications:

Where are there trees? Where could there be trees?

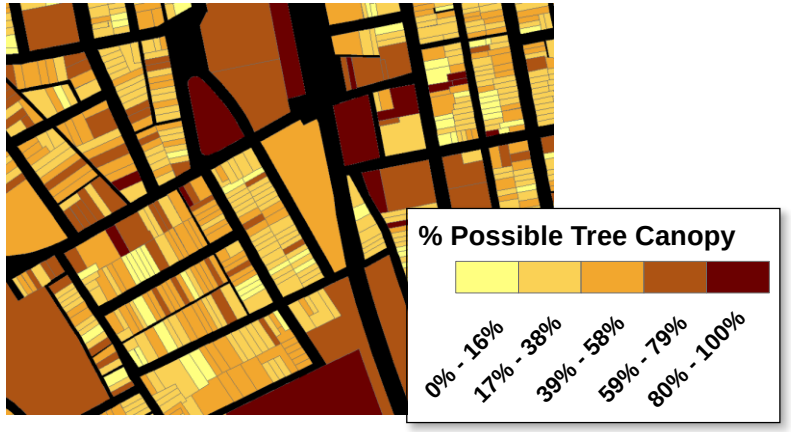
Take the UTC Assessment…

+

…And add parcel-level ownership data

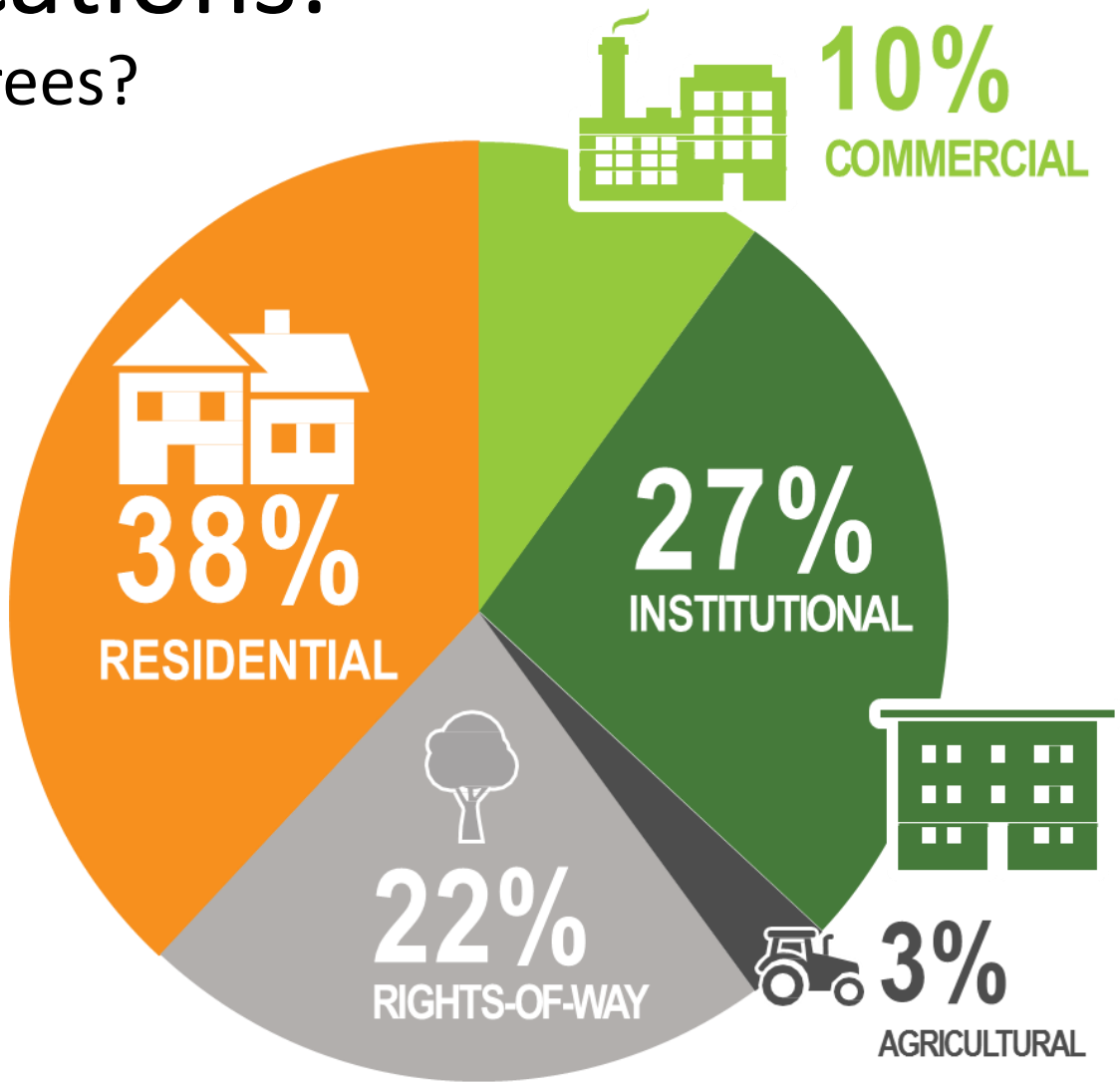
=

To understand where there are trees (above) *and* where could there be trees (below)



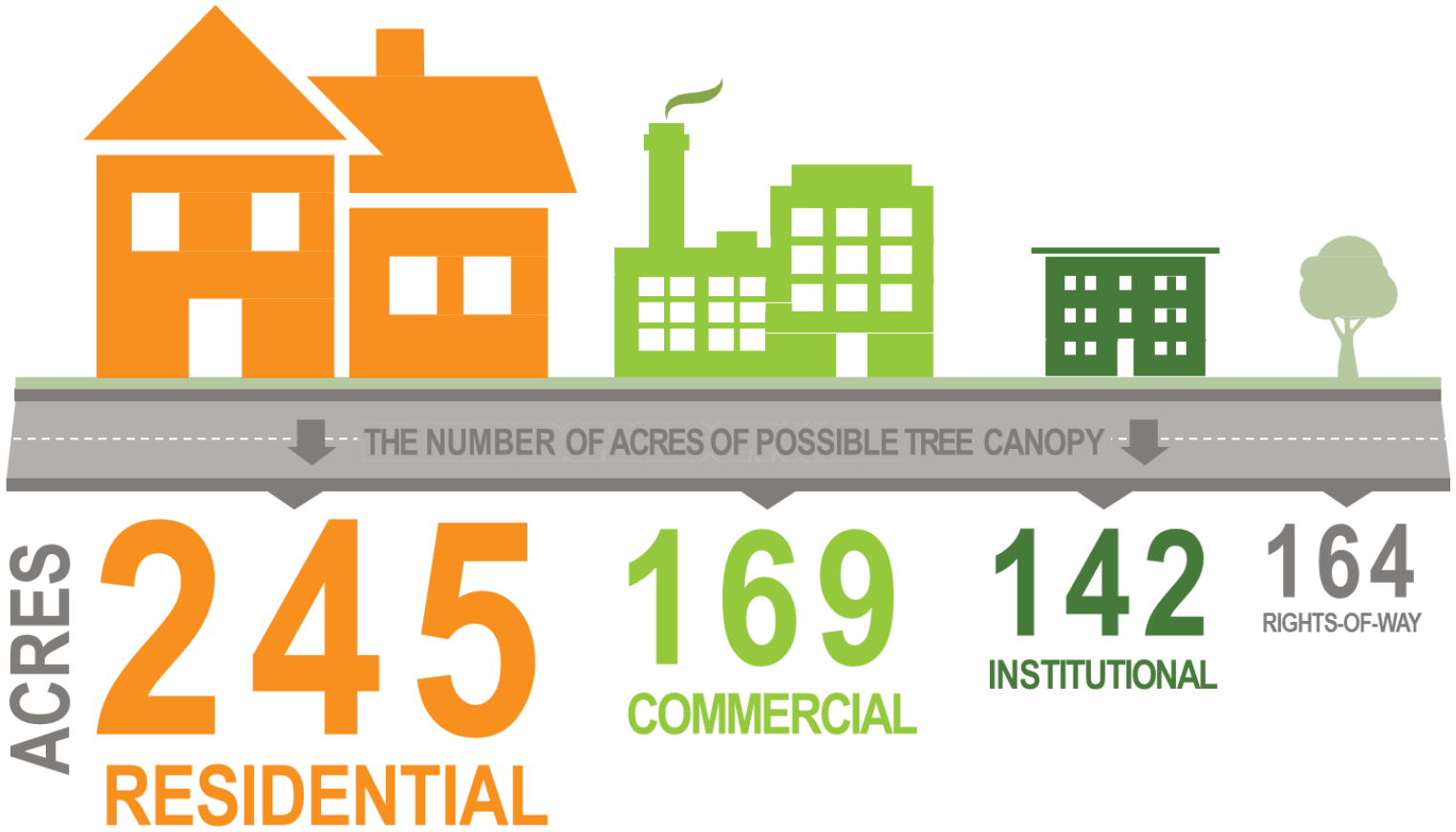
UTC Applications:

Who owns the trees?



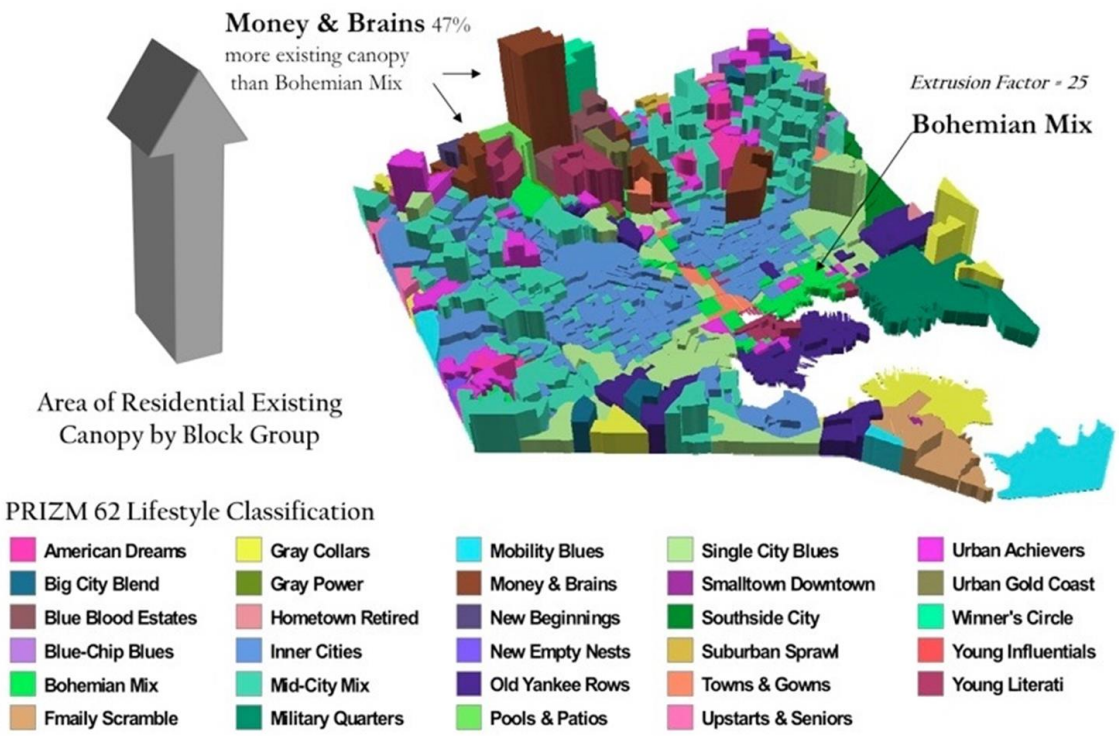
UTC Applications:

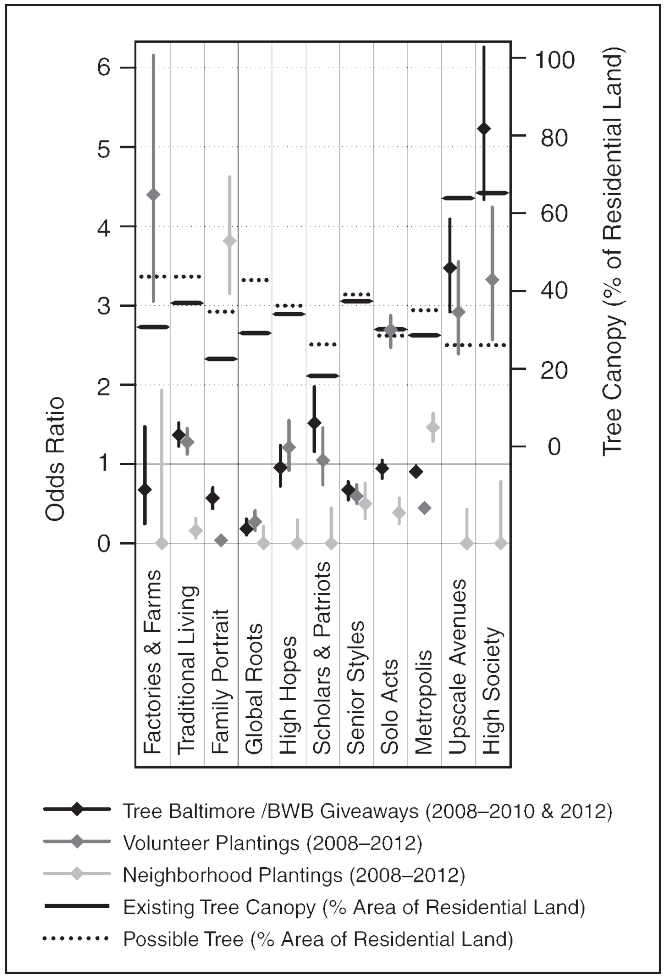
Who has the most room to plant new trees?



UTC Applications:

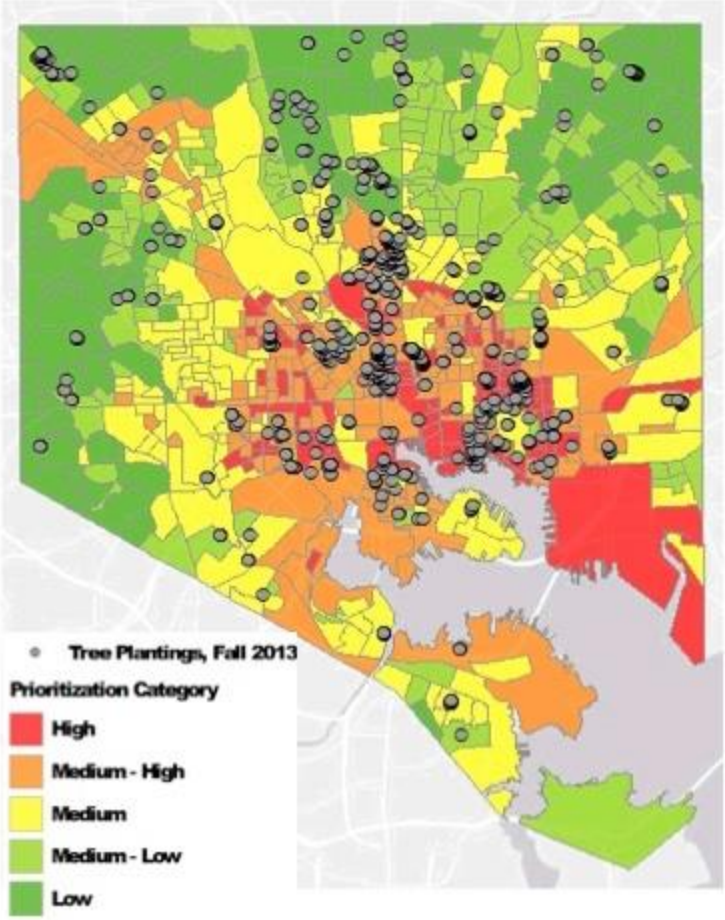
Market analysis and segmentation - Who has the most existing trees? Who is most likely to plant trees?

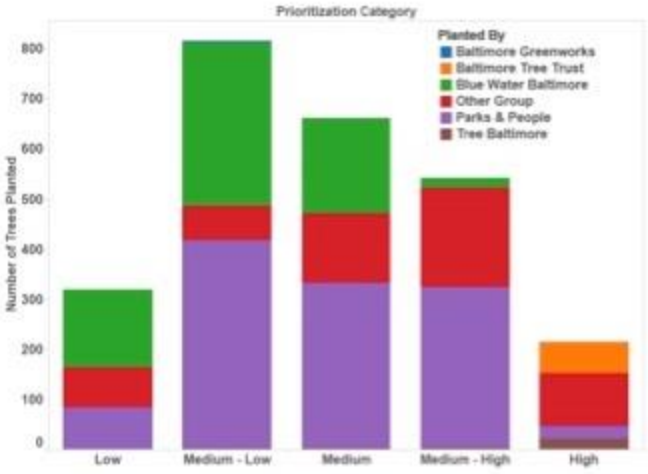




UTC Applications:

Prioritize and track tree planting efforts





i-Tree 101

i-Tree: Demonstrating That Trees Pay Us Back!

i-Tree…

"Putting USFS Urban Forest science into the hands of users"

- Public domain software
- Based on peer-reviewed res
- Technical support
- Continuously improved

www.itreetools.org

A Cooperative Initiative Between:

DAVEY · Arbor Day Foundation · sma Society of Municipal Arborists · ISA · Casey Trees

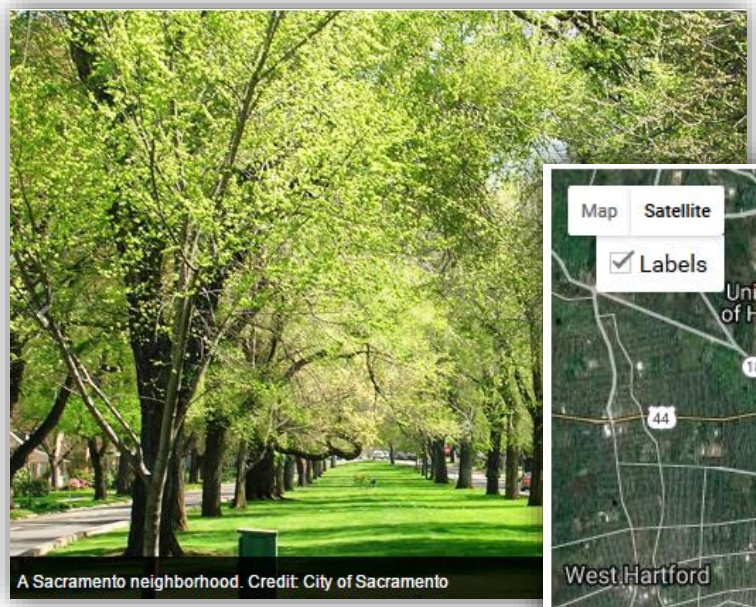
Introduction to the i-Tree suite of tools

i-Tree captures tree benefits

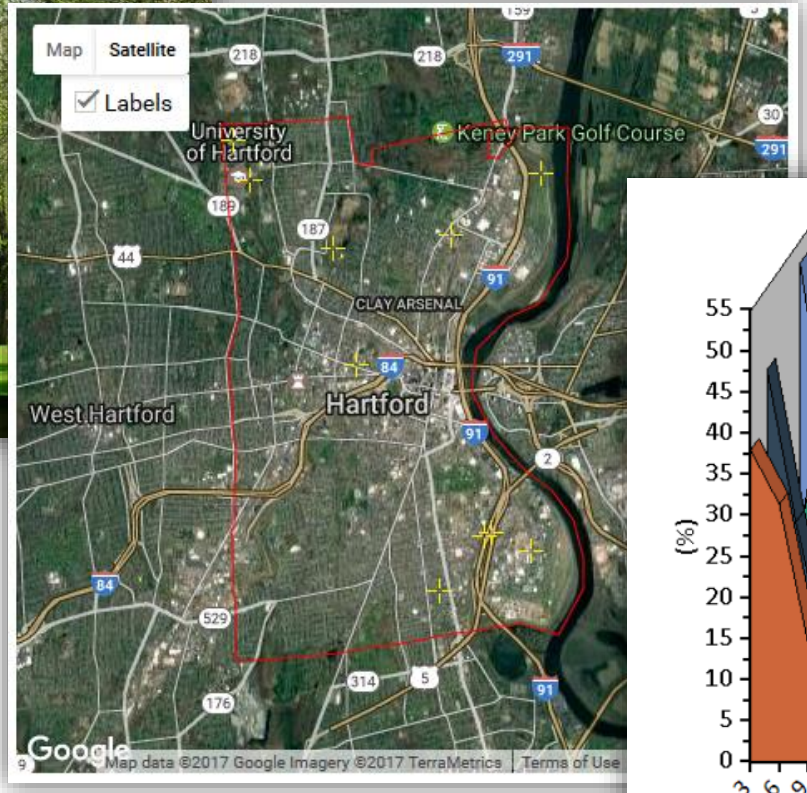
- Avoided run-off
- Carbon storage
- Carbon sequestration
- Air pollution removal
- Health benefits
- Energy use
- Structural value
- $ value

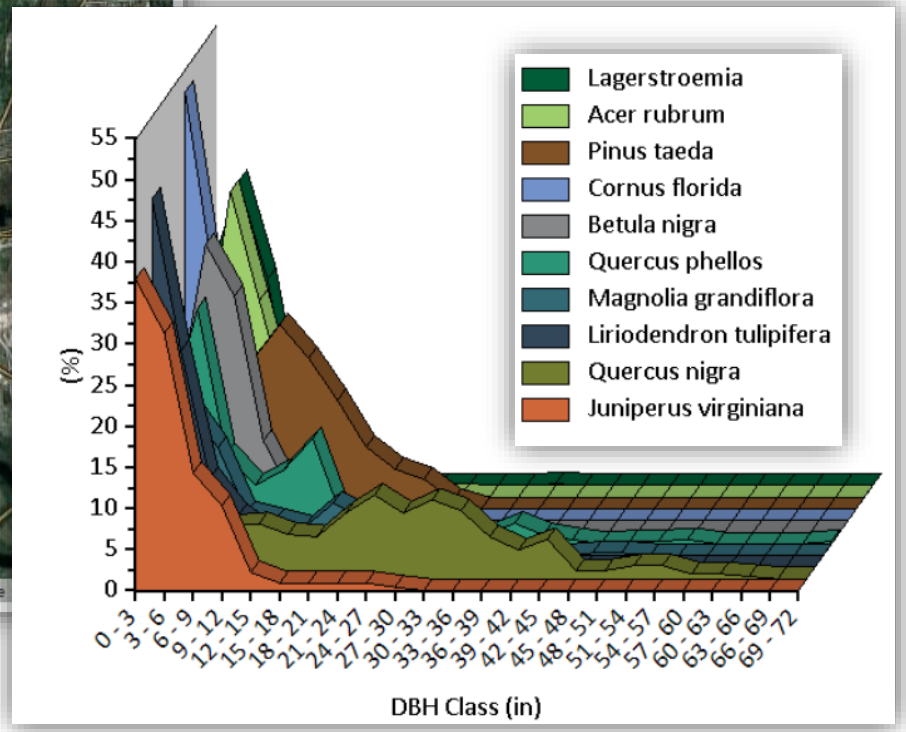
Using this info, finding what is important to your community, is the key to successful projects

Structure → Function → Benefits → Value



A Sacramento neighborhood. Credit: City of Sacramento





….state, municipality, region, watershed, neighborhood, home, etc.

The 2017 i-Tree Suite of Tools

Web-based, run in your browser

i-Tree Design

i-Tree Canopy

i-Tree Landscape

i-Tree Database

Installed on a Windows desktop or laptop

i-Tree Eco

i-Tree Streets

i-Tree Hydro

The 2017 i-Tree Suite of Tools

Web-based, run in your browser

Internationally applicable

Installed on a Windows desktop or laptop

i-Tree™ Canopy

i-Tree™ Database

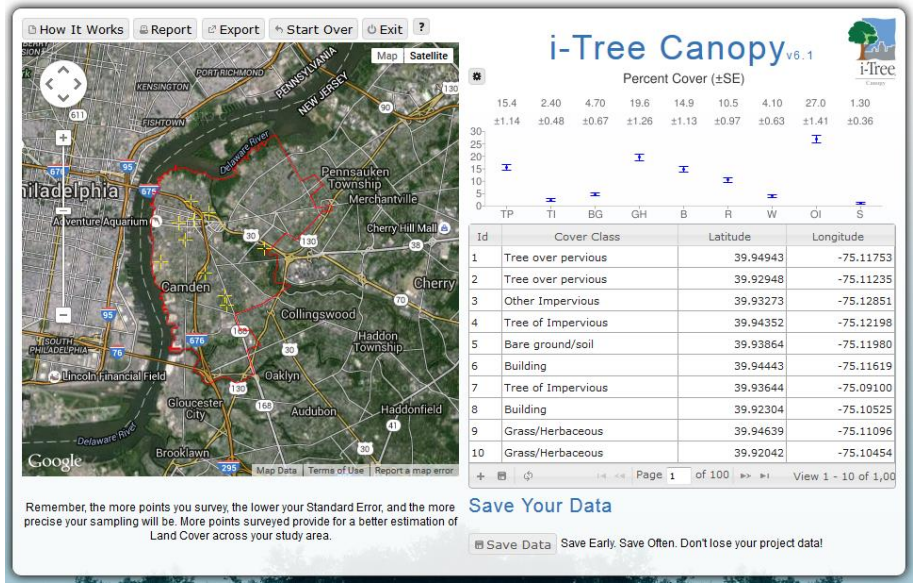
i-Tree™ Eco

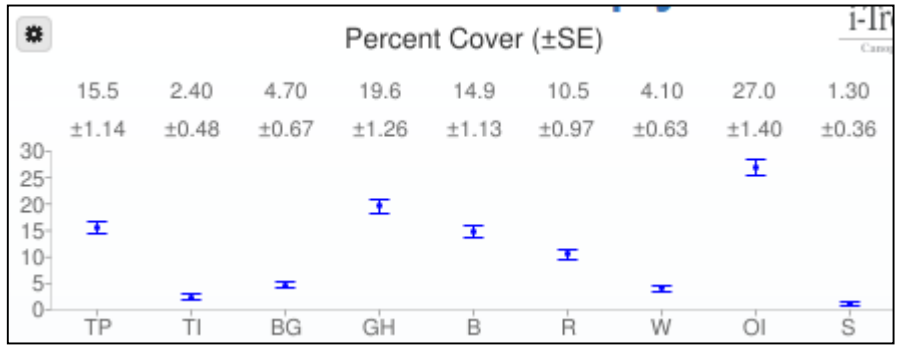
i-Tree™ Hydro

What is i-Tree Canopy?

Tool to estimate tree canopy cover

- Facilitates user guided aerial image interpretation
- Flexible, user-defined boundaries
- Flexible, user-defined cover categories
- Estimates air pollution and carbon benefits of tree canopy
- Estimates $ value of benefits

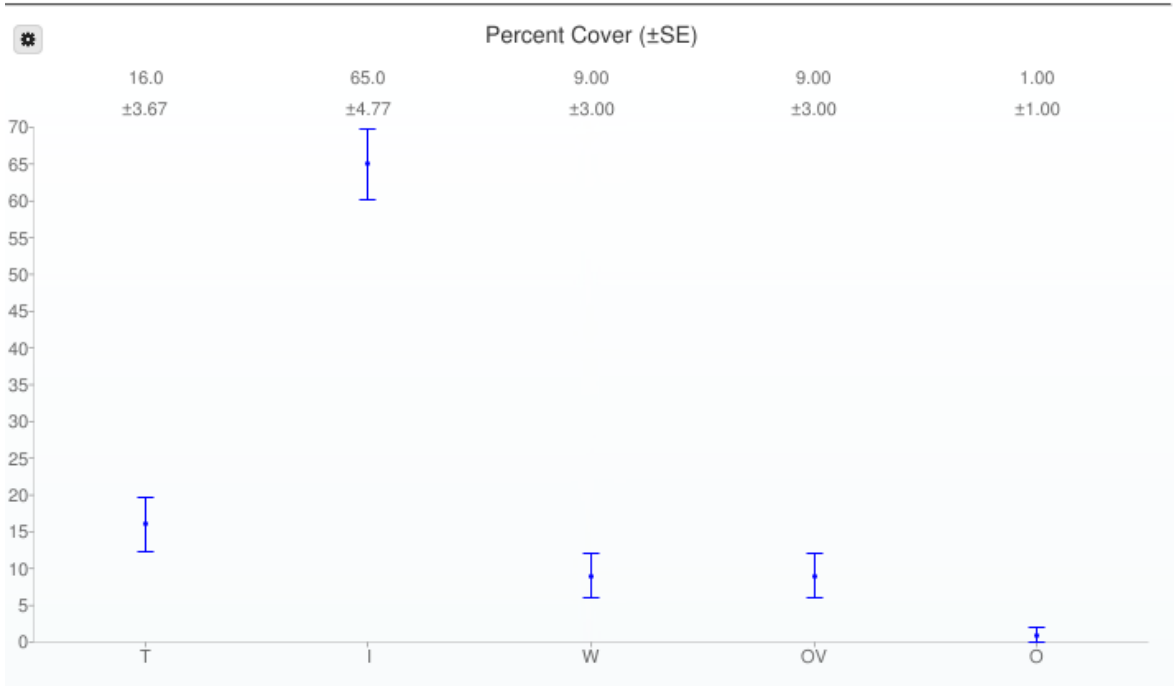




500-1000 points later … Results!

$$\% \text{ cover} = \frac{\text{points in cover type}}{\text{total points assessed}}$$

$$\text{cover type area} = \% \text{ cover } \times \textit{total area}$$



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	16	16.0 ±3.67
Impervious Surface	All impervious surface	I	65	65.0 ±4.77
Water	Open water	W	9	9.00 ±3.00
Other Vegetation	Any non tree vegetation - grasses, shrubs, etc.	OV	9	9.00 ±3.00
Other	any other cover type	O	1	1.00 ±1.00

…Results!

Tree Benefit Estimates

Abbr.	Benefit Description	Value	±SE	Amount	±SE
CO	Carbon Monoxide removed annually	$3.06	±0.70	37.96 lb	±8.70
NO2	Nitrogen Dioxide removed annually	$1.72	±0.39	87.11 lb	±19.96
O3	Ozone removed annually	$95.70	±21.93	1,080.66 lb	±247.61
PM2.5	Particulate Matter less than 2.5 microns removed annually	$140.89	±32.28	46.78 lb	±10.72
SO2	Sulfur Dioxide removed annually	$0.07	±0.02	14.73 lb	±3.38
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	$100.06	±22.93	282.63 lb	±64.76
CO2seq	Carbon Dioxide sequestered annually in trees	$2,580.34	±591.23	133.26 T	±30.53
CO2stor	Carbon Dioxide stored in trees (Note: this benefit is not an annual rate)	$41,774.41	±9,571.72	2,157.40 T	±494.32

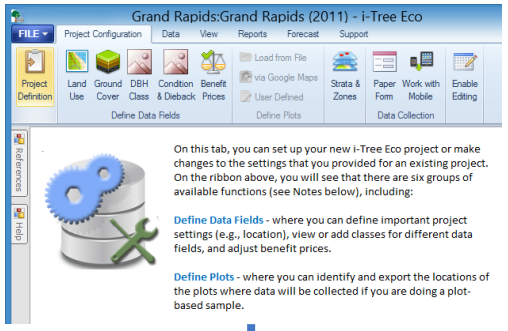
Pollutant removal and carbon sequestration rates per acre of canopy were determined for the urban and rural areas in each US county using i-Tree Eco methodology

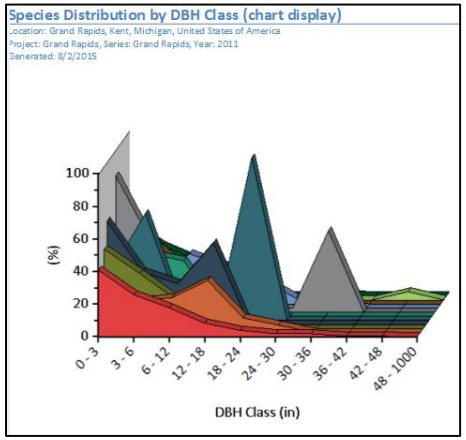
Valuations for pollutant removals are based the EPA's BenMAP model and incorporate the estimates of the human population affected.

Advantages	Limitations
• Statistically valid estimates • Canopy cover estimated in ½ a day • Flexible boundaries and cover types • No GIS software or experience needed • Web-based, only requires an internet connection and a browser	• Removal rates and valuations based on US data • Limited to imagery available in Google satellite view • Date of image not readily available • Results are not spatially explicit • GIS expertise needed for more complex projects

What is i-Tree Eco?

- Field-based assessment requiring inventory data
- Flagship software based on latest science & local data
- Originally developed for assessing whole urban forest
- Adapted for individual tree assessments
- Internationally applicable





i-Tree Eco Assess:

Structure

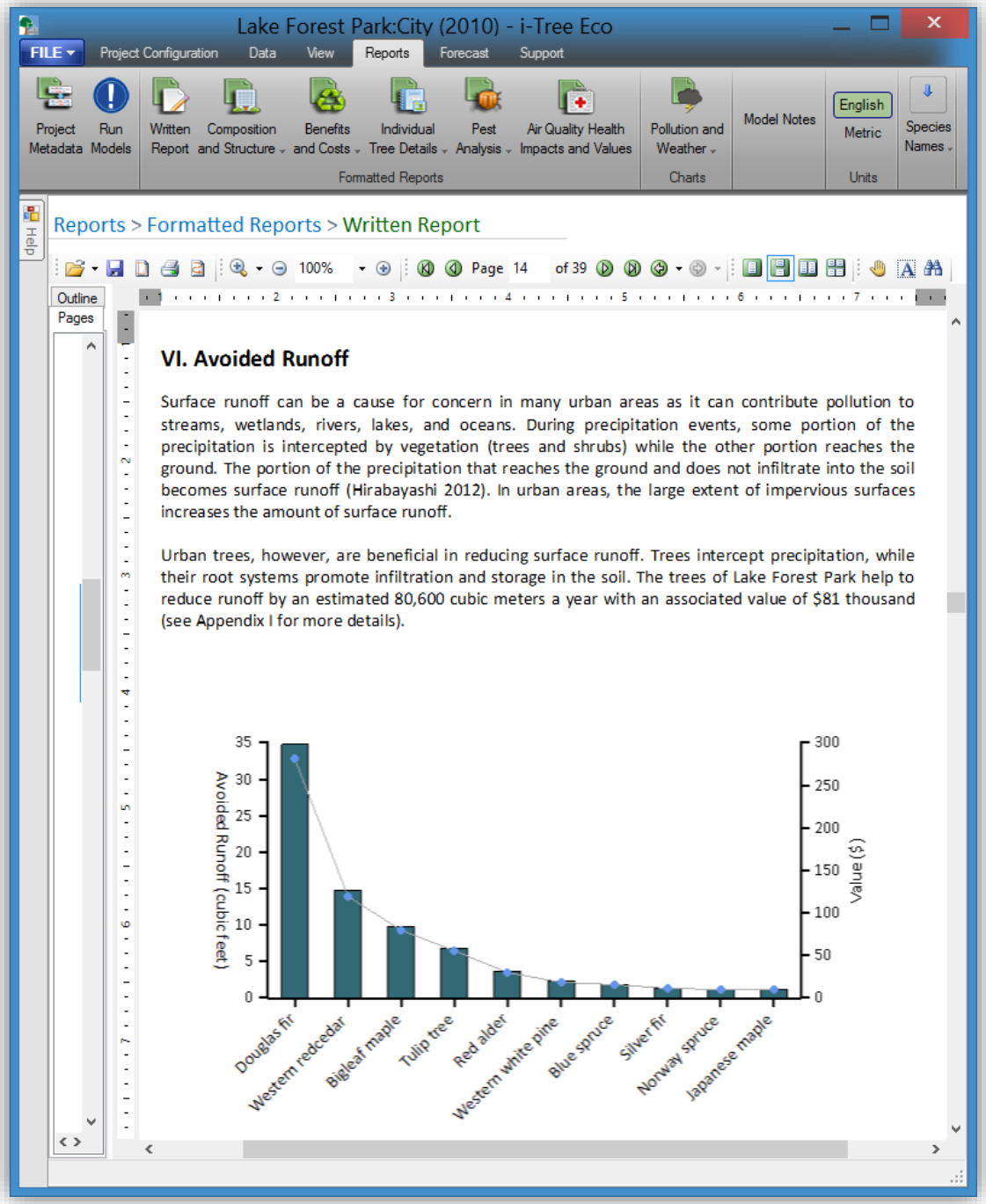
Function

- Energy effects
- Air quality
- Carbon
- Avoided runoff
- UV impacts
- VOCs

Value ($)

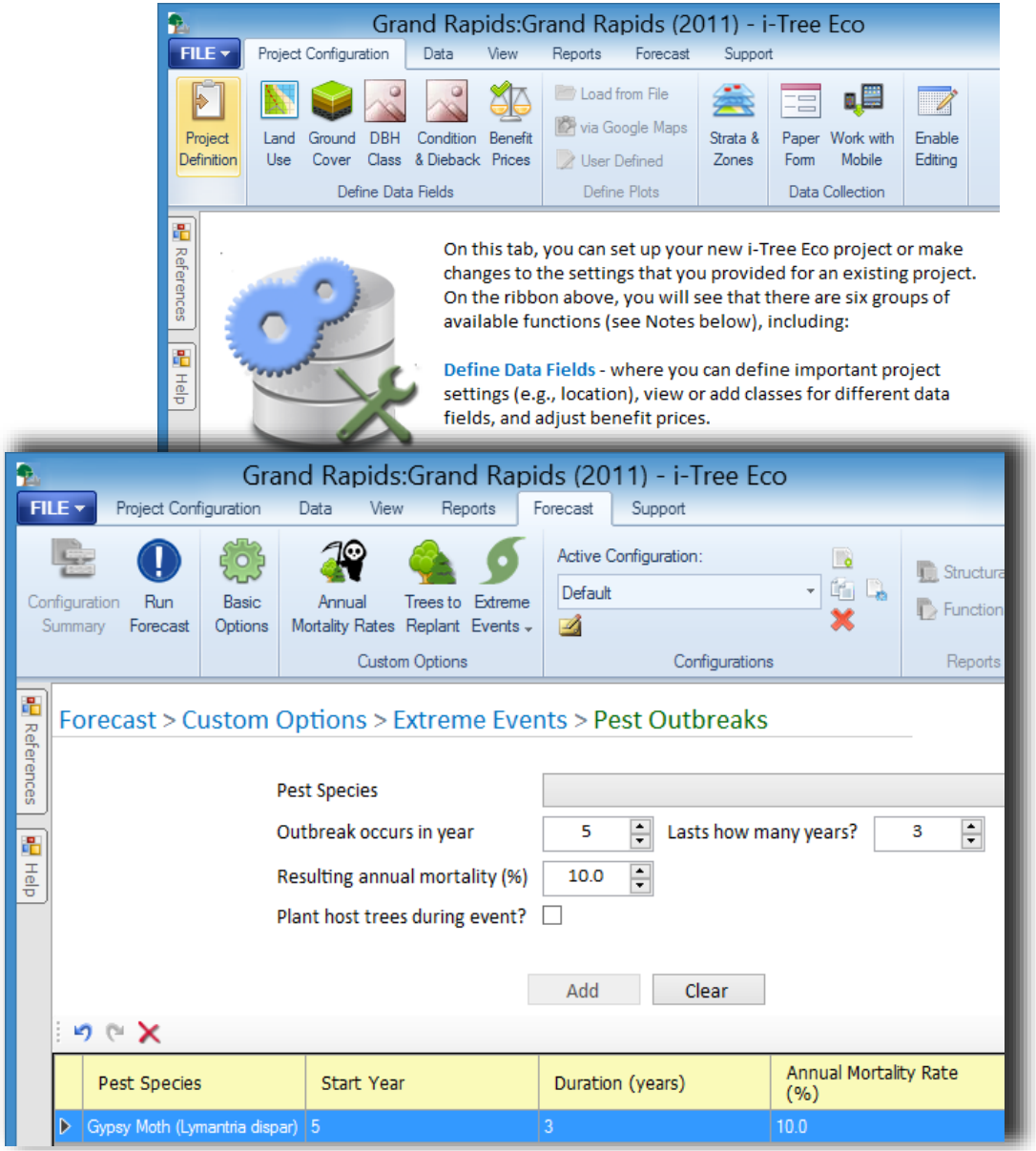
Management info

- Pest risk
- Tree health
- Custom tasks



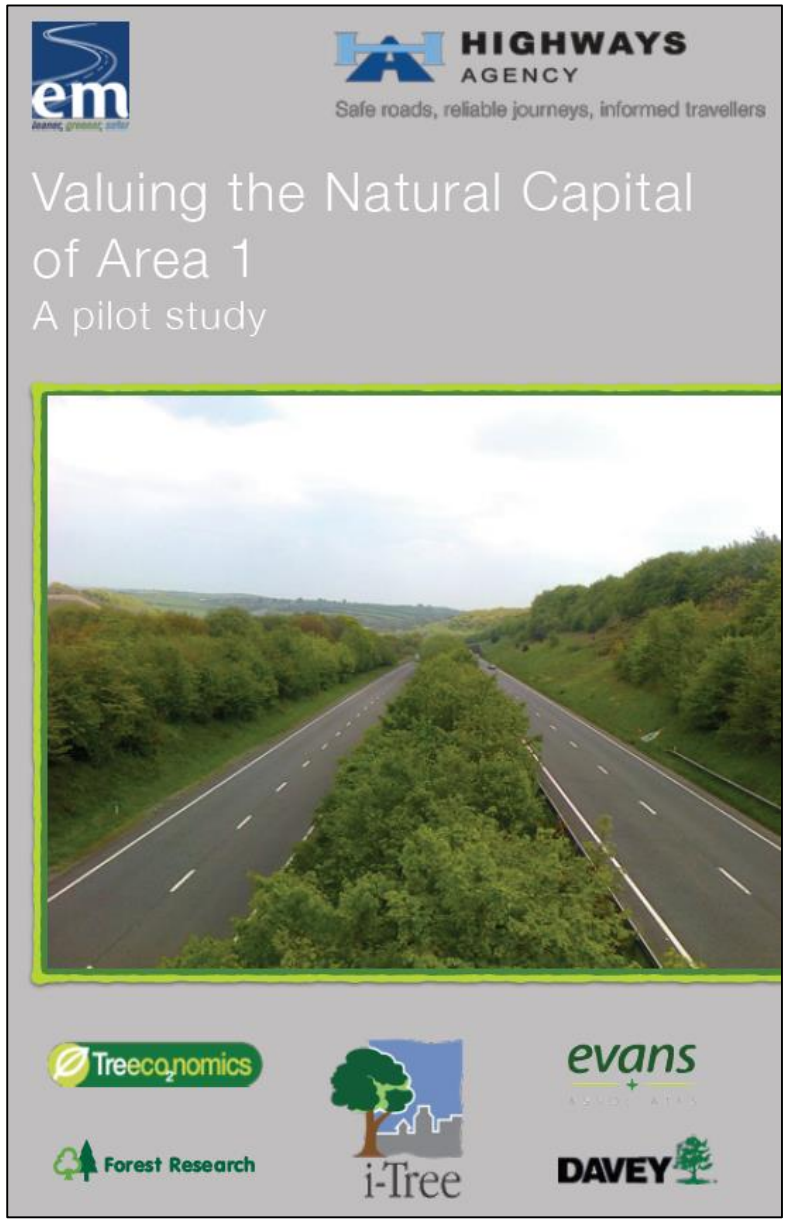
Eco v6 Highlights…

- Simplified & new data collection options
- Forecasting capabilities
- New user interface
- Updated and expanded reporting options
- Desktop processing for USA, AUS, CAN & UK projects



Who is using Eco?

- Governments
- Non-Profits
- Universities & campuses
- Graduate student research
- International users
- Consultants
- Increasing interest from ecological restoration & parks
- US Government (Urban Forest Inventory and Analysis)



i-Tree Eco Australian Adaptation

Added species

Seasonality adaptation

Carbon

- Local biomass equations

Air Pollution

- Local, 5 pollutant data

Energy

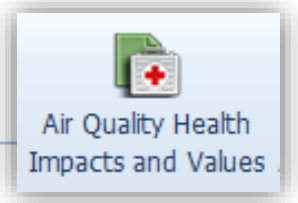
- Analog climate region and fuel mixes

Valuation

- Different structural value (CTLA) formula

International limitations

- Certain results unavailable
  - Health benefits
  - Wildlife support
- Data limitations
  - Weather data availability
  - Limited pollution



Air Quality Health Impacts and Values

Location: Adrian, Lenawee, Michigan, United States of America
Project: Adrian, Series: Adrian_2012, Year: 2012
Generated: 3/2/2017

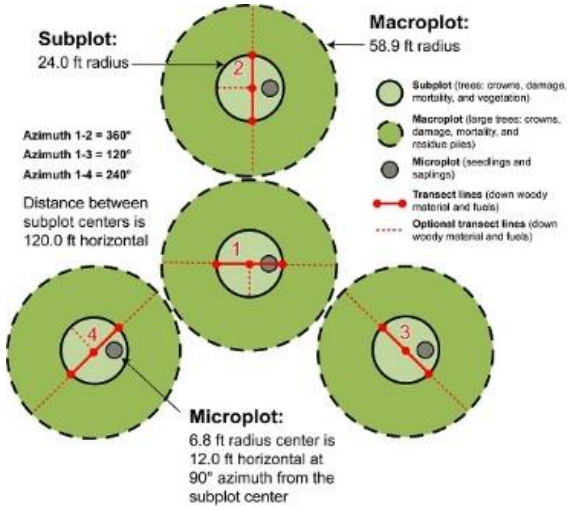
		NO2		PM2.5	
		Incidence Reduction/yr	Value ($/yr)	Incidence (Reduction/yr)	Value ($/yr)
Tree	Acute Bronchitis			0.013	1.13
	Acute Myocardial Infarction			0.005	415.32
	Acute Respiratory Symptoms	1.149	36.28	7.167	702.49
	Asthma Exacerbation	17.105	1,431.52	6.019	489.28
	Chronic Bronchitis			0.006	1,544.01
	Emergency Room Visits	0.014	5.98	0.008	3.38
	Hospital Admissions	0.031	931.06		
	Hospital Admissions, Cardiovascular			0.002	64.85
	Hospital Admissions, Respiratory			0.002	60.17
	Lower Respiratory Symptoms			0.158	8.21

i-Tree Database can help address some of these

Urban Forest Inventory & Analysis (Urban FIA) 101

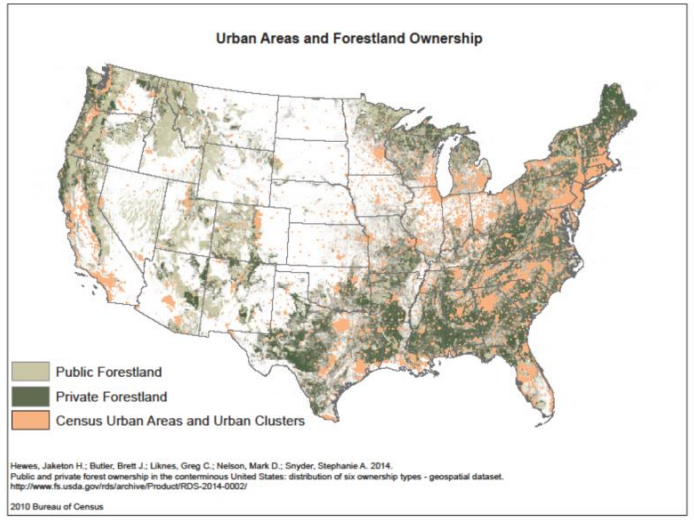
What is FIA?

- 1930 – First FIA survey. Represents continuous survey to provide information on the amount, status, and character of forest land across the country
  - Only within FIA-defined “forest land”
  - Excluded urban trees
- 2014 - U.S. Farm Bill included urban forest monitoring in its strategic plan; FIA initiated an annualized urban inventory program.



What is **Urban** FIA?

- FIA and i-Tree partnered to develop Urban FIA protocols/design – tiers to a strategic, consistent national inventory for urban forests.
  - Data is collected was analyzed using FIA methodologies and i-Tree Eco.
- Goal is to **annually monitor** the nation's urban forests with special emphasis in the largest (iconic) cities of America!



Urban FIA – plot design

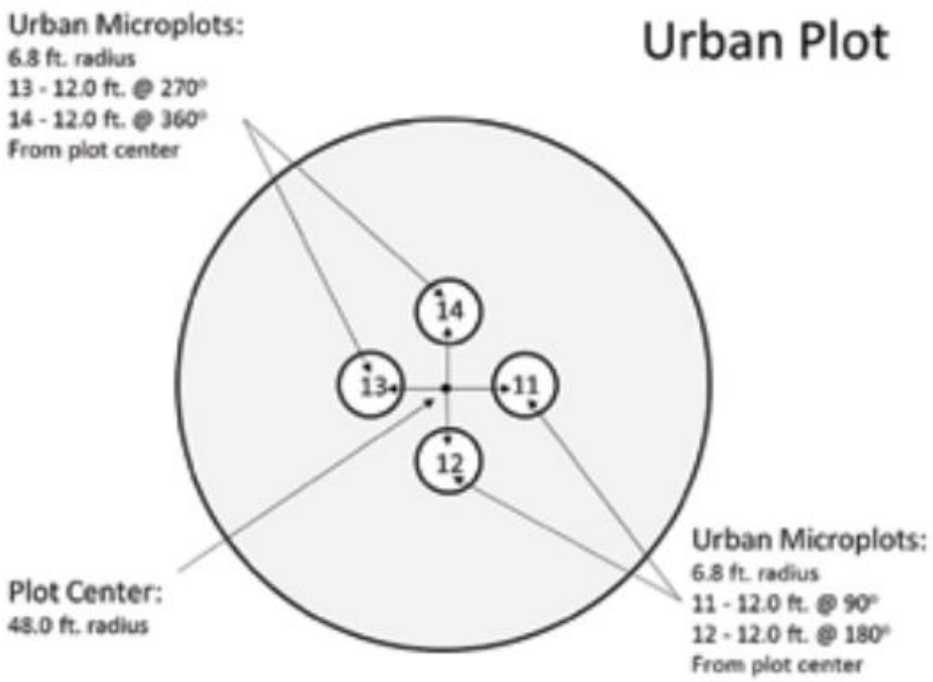


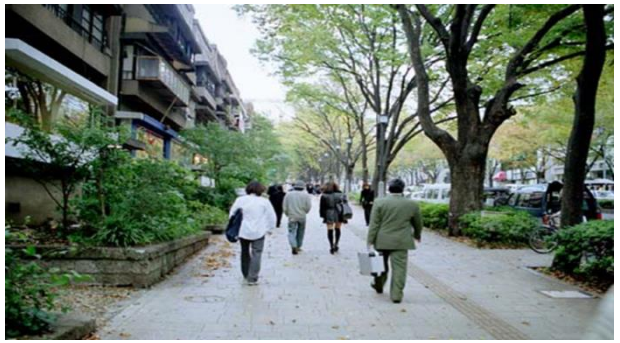
Figure 3—Urban forest inventory plot diagram, Houston, 2015.

Ground-up (what top-down can't yet tell us…):

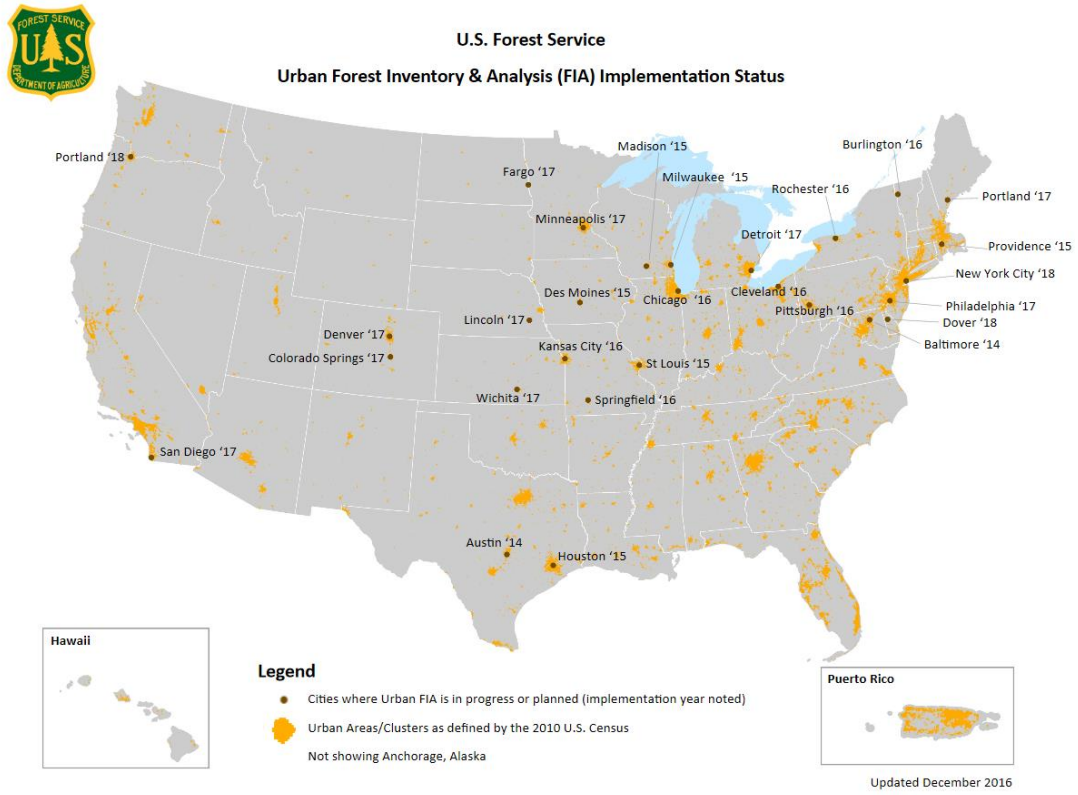
- Species
- Size
- Crown condition
- Damage
- Ground cover

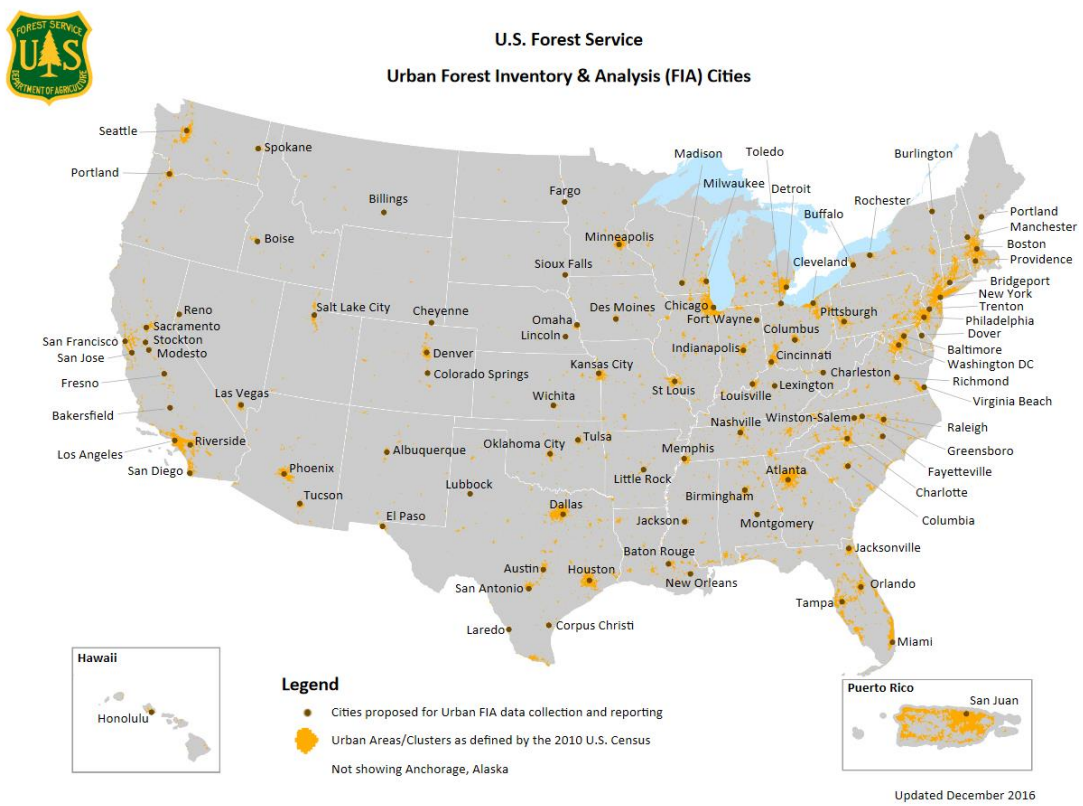
Why Urban FIA in the U.S.?

- Urban areas home to >80% of population
- Urban forests on front line of service to people
- Urban forests not covered by strategic monitoring program
- Urban areas currently cover ~68 million acres (size of CO)
- Urban areas projected to cover ~165 million acres by 2060 (size of TX)
- The 2014 Farm Bill has instructed FIA to inventory and monitor Urban Areas



Where is Urban FIA happening?



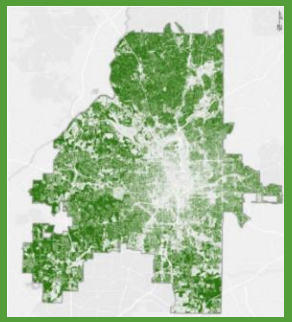


Urban FIA - international

- We have domestic protocols (Urban FIA Field Guide) available. This might work for other countries… (China?)
  - Why do you want urban data / an urban inventory?
    - General knowledge
    - Reporting
    - Management decisions
    - Prioritization
  - Design should:
    - Be based on needs
    - Within a broader national monitoring system (akin to FIA)

Urban FIA

Urban Forest Inventory



Urban wood resource
(Public and private lands)
&
Processors/Producers

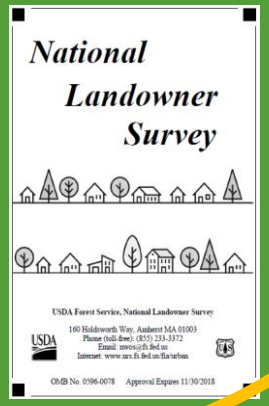
Private landowner management practices

- Sources of information
- Attitudes, beliefs and concerns about urban forest

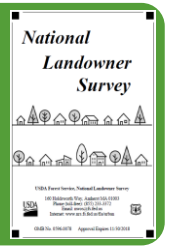
Urban TPO Survey

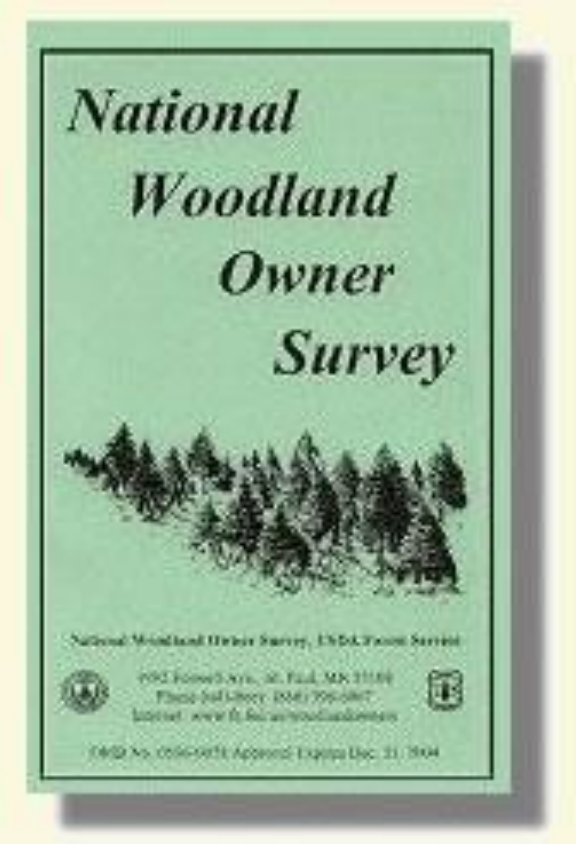
Private landowner management practices
&
Attitudes and behaviors towards urban wood products

Urban Landowner Survey



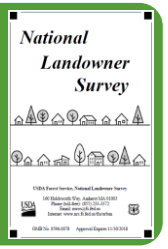
Urban
Landowner
Survey





Urban Landowner Survey

Urban Landowner Survey



Respondent universe

- **Private residential property owners** within the U.S. Census Core Based Statistical Areas and Census defined urban areas and clusters
- **Must own green space**: land of any size and area with vegetation and/or water to include gardens, lawns, grassland, trees, shrubs, and water bodies

Questionnaire

- Ownership and land information
- Activities (current, past, future, expenditures)
- Neighborhood and community
- Environmental programs and organizations (awareness and membership)
- Sources of Information and Assistance
- Tree Planting and Care
- Benefits and Concerns
- Urban Wood Use
- Demographics

Questionnaire: Ownership and Land Information

1. My property has the following features: *Check all that apply*.

- ☐ A back yard
- ☐ A front yard
- ☐ A side yard(s)
- ☐ Trees and/or shrubs that were planted
- ☐ Trees and/or shrubs that grew naturally
- ☐ Vegetable/fruit garden
- ☐ A flower garden
- ☐ A recreational feature, such as a tennis or basketball court
- ☐ A water feature, such as a pool or pond
- ☐ A driveway
- ☐ Patio, porch, or deck
- ☐ Shed or other storage building
- ☐ None of these

Questionnaire: Activities

12. Which of the following, if any, have occurred on your propertt in **the past 5 years**?
Check all that apply.

- ☐ Eliminated or removed invasive plants
- ☐ Installed a rain barrel or rain garden
- ☐ Installed a new lawn
- ☐ Planted shrubs, flowers, or ornamental grasses
- ☐ Planted trees
- ☐ Pruned trees
- ☐ Removed whole trees
- ☐ Other (please specify): _____
- ☐ None of the above

13. Which of the following, if any, regularly occur your property?
Check all that apply.

- ☐ Composting yard and/or food waste
- ☐ Gardening
- ☐ Mowing the lawn
- ☐ Recreational activities, such as games, sports, or children playing
- ☐ Applied fertilizers to lawn
- ☐ Applied fertilizers to trees
- ☐ Used chemicals to control weeds or insects
- ☐ Social activities, such as cookouts or parties
- ☐ Watching birds or other wildlife
- ☐ Watering lawn, trees, or other plants
- ☐ Other (please specify): _____
- ☐ None of the above

Questionnaire: Sources of Information and Assistance

23. How familiar are you with the services provided by the following professionals?
Check one box for each item.

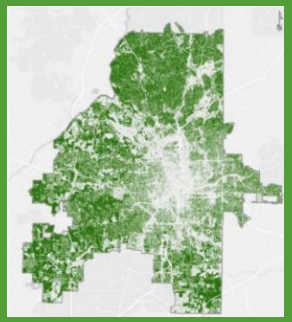
	Extremely familiar	Moderately familiar	Somewhat familiar	Slightly familiar	Not at all familiar
Municipal tree care professionals	☐	☐	☐	☐	☐
Private tree care professionals	☐	☐	☐	☐	☐
Landscape designers	☐	☐	☐	☐	☐
Landscape contractors	☐	☐	☐	☐	☐
Extension agents	☐	☐	☐	☐	☐
Master gardeners	☐	☐	☐	☐	☐

Draft

24. In the past 5 years, have you talked with anyone or received information/advice about how to maintain your property's landscape?

Urban FIA

Urban Forest Inventory



Urban wood resource
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Urban TPO Survey

Private landowner management practices
&
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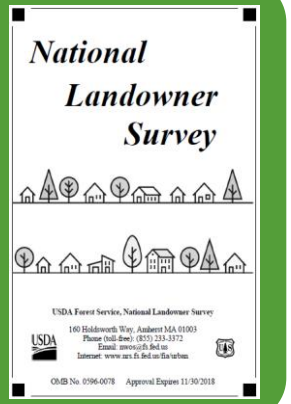
Urban Landowner Survey



When a tree is cut on an FIA plot…

Urban TPO Survey

1) When was the tree cut? – sometime between the last visit to the plot and the current visit

2) What type of product was that tree used for? – saw logs, veneer, pulpwood, firewood, etc.

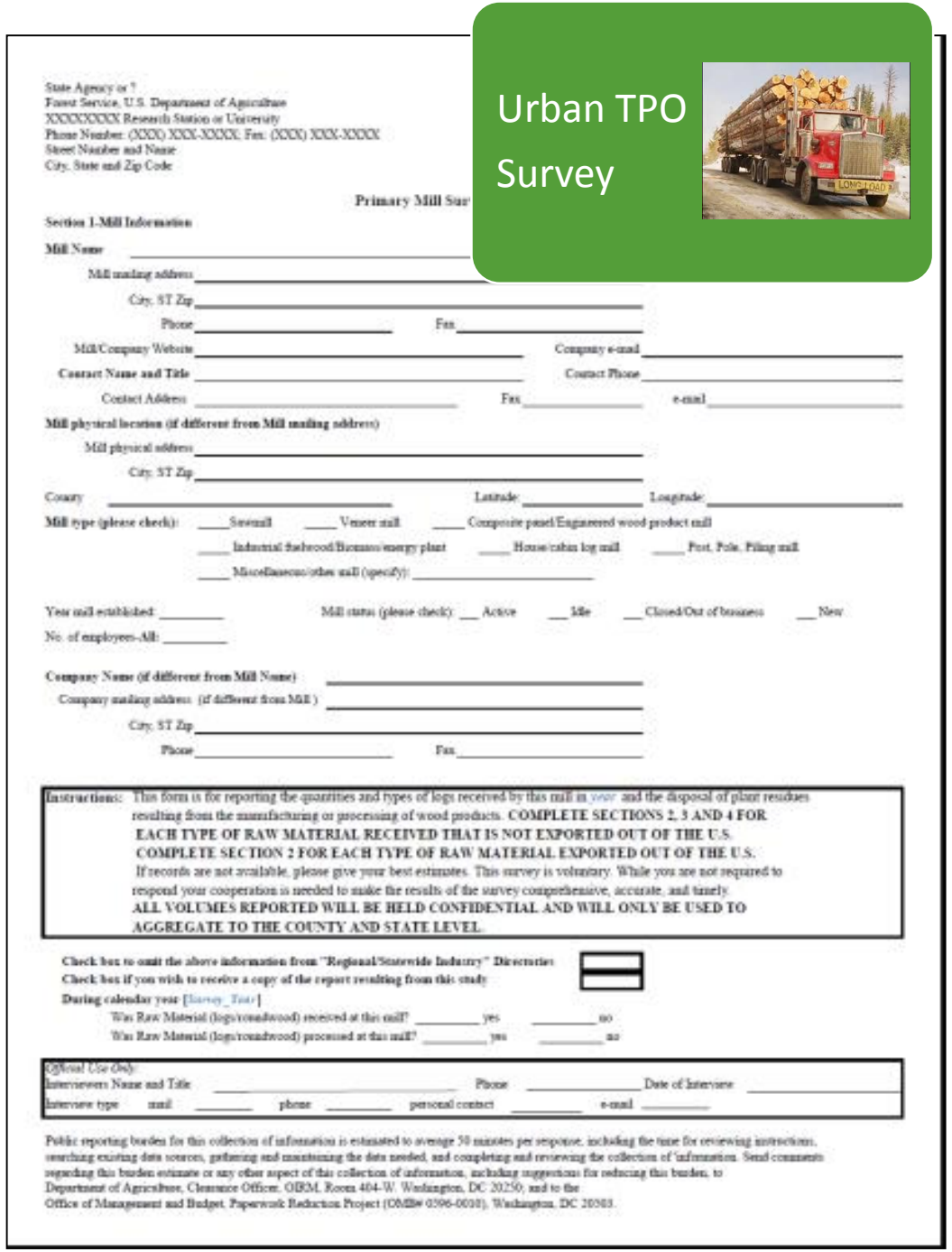
3) Where was that tree processed? – same or adjacent county, out of State, out of County

4) How much of the tree was used for products, and how much was left as residue and slash?

We can ask the same questions in urban areas!

TPO Mill Surveys

The mill questionnaires are designed to determine the size and composition of a state's primary wood-using industry, its use and source of roundwood, and its generation and disposition of wood residues.



State Agency or ?
Forest Service, U.S. Department of Agriculture
XXXXXXXX Research Station or University
Phone Number: (XXX) XXX-XXXX; Fax: (XXX) XXX-XXXX
Street Number and Name
City, State and Zip Code

Primary Mill Sur

Section 1-Mill Information

Mill Name _____

Mill mailing address _____

City, ST Zip _____

Phone _____ Fax _____

Mill/Company Website _____ Company e-mail _____

Contact Name and Title _____ Contact Phone _____

Contact Address _____ Fax _____ e-mail _____

Mill physical location (if different from Mill mailing address)

Mill physical address _____

City, ST Zip _____

County _____ Latitude: _____ Longitude: _____

Mill type (please check): ____Sawmill ____ Veneer mill ____ Composite panel/Engineered wood product mill
____ Industrial fuelwood/Biomass/energy plant ____ House/cabin log mill ____ Post, Pole, Piling mill
____ Miscellaneous/other mill (specify): _____

Year mill established: _____ Mill status (please check): __ Active __ Idle __ Closed/Out of business __ New

No. of employees-All: _____

Company Name (if different from Mill Name) _____

Company mailing address (if different from Mill) _____

City, ST Zip _____

Phone _____ Fax _____

Instructions: This form is for reporting the quantities and types of logs received by this mill in year and the disposal of plant residues resulting from the manufacturing or processing of wood products. COMPLETE SECTIONS 2, 3 AND 4 FOR EACH TYPE OF RAW MATERIAL RECEIVED THAT IS NOT EXPORTED OUT OF THE U.S. COMPLETE SECTION 2 FOR EACH TYPE OF RAW MATERIAL EXPORTED OUT OF THE U.S. If records are not available, please give your best estimates. This survey is voluntary. While you are not required to respond your cooperation is needed to make the results of the survey comprehensive, accurate, and timely. ALL VOLUMES REPORTED WILL BE HELD CONFIDENTIAL AND WILL ONLY BE USED TO AGGREGATE TO THE COUNTY AND STATE LEVEL.

Check box to omit the above information from "Regional/Statewide Industry" Directories
Check box if you wish to receive a copy of the report resulting from this study
During calendar year [Survey_Year]
Was Raw Material (logs/roundwood) received at this mill? _____ yes _____ no
Was Raw Material (logs/roundwood) processed at this mill? _____ yes _____ no

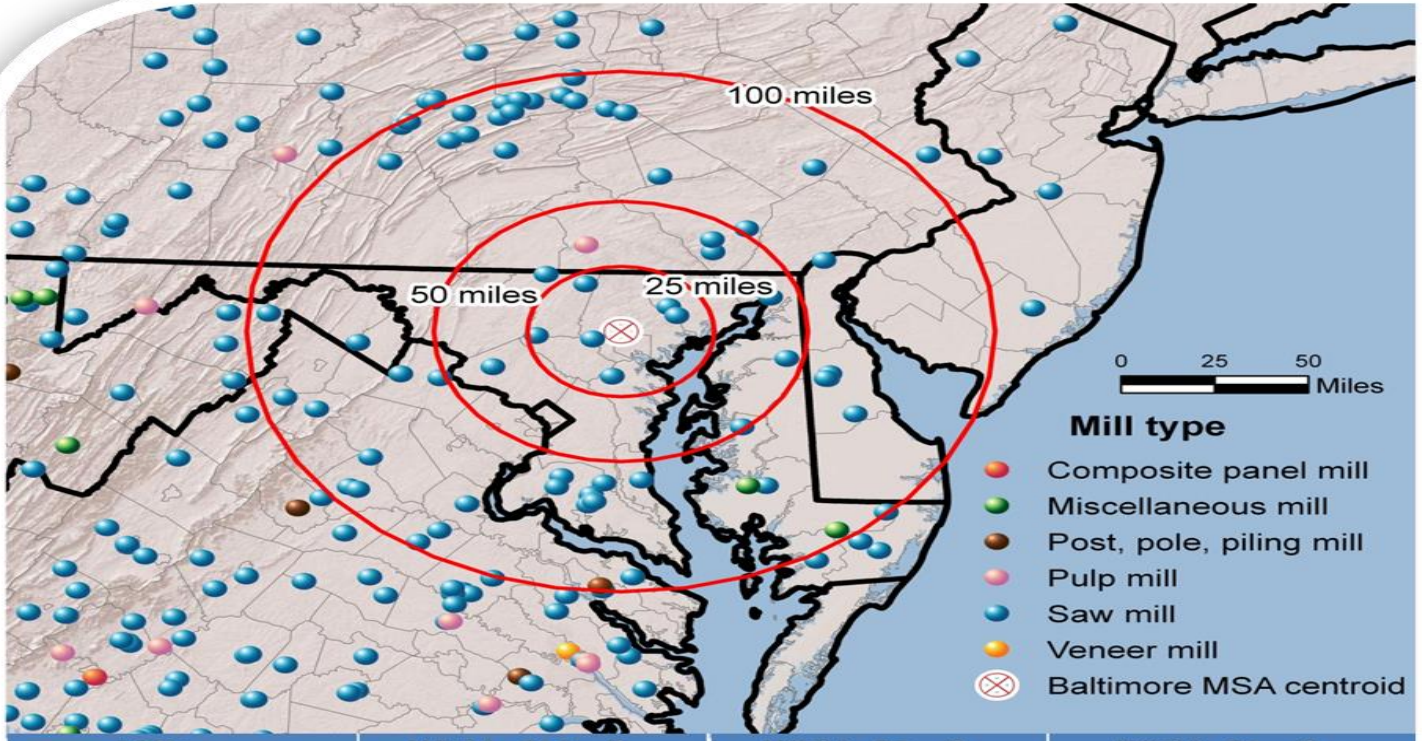
Official Use Only:
Interviewers Name and Title _____ Phone _____ Date of Interview _____
Interview type mail _____ phone _____ personal contact _____ e-mail _____

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, DC 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB# 0596-0030), Washington, DC 20503.

Urban TPO Survey

Urban FIA TPO Scoping Report

Urban TPO Survey



Mill type	Within 100 miles	Within 50 miles	Within 25 miles
Miscellaneous mill	2		
Post, pole, piling mill	1		
Pulp mill	1	1	
Saw mill	67	13	6
Total	71	14	6

- How is urban wood being used?
- Who is using it?
- Where is it coming from?
- Where is it going?

Urban FIA TPO Scoping Report

Urban TPO Survey

In spring of 2016, UFIA contacted federal, state, and local partners in Baltimore, Chicago, Austin, Boulder, and San Diego to obtain answers to seven scoping questions:

1. What information is needed by the urban area?

2. Can we assume estimates specific to the urban area would be most beneficial?

3. Are communities interested in the products created from their waste or the products created by facilities within their community, or both?

4. What do various communities consider wood waste – just tree, or tree and other such as pallets, building scraps etc.

5. Does the urban area/city have a utilization plan?

6. What are characteristics of utilization operations?

7. How much tree material is disposed of in landfills and the quality of that material. In other words – is there a relatively recent landfill survey?

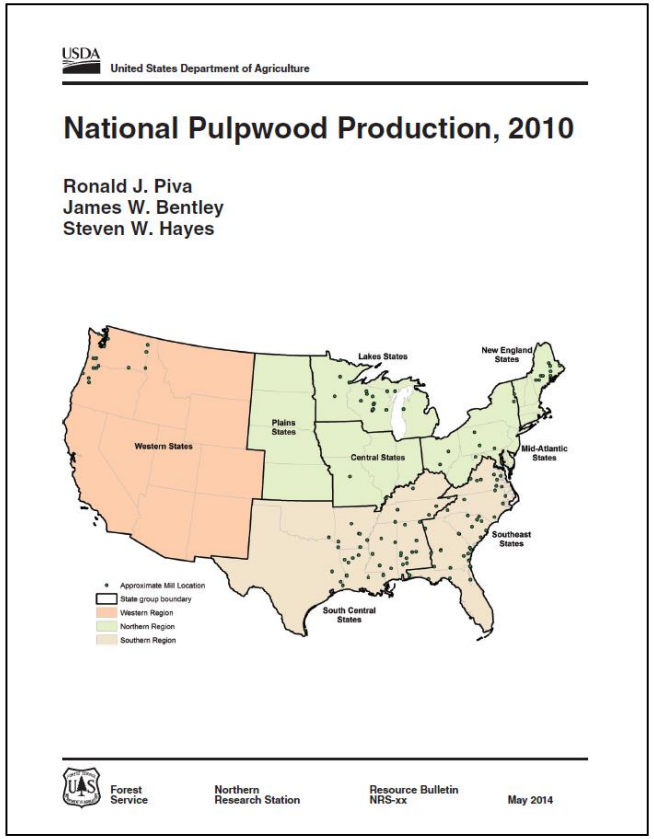
Urban TPO Survey

Urban TPO: Why do we care?

- Urban and suburban tree and woody residues are similar in magnitude to harvest removals from national forests.
- Urban and suburban area will expand over time and so will the waste.
- Efficient use of waste material reduces material in landfills, creates jobs, and sequesters carbon if it’s a durable product.

Urban TPO Products?

Urban TPO Survey

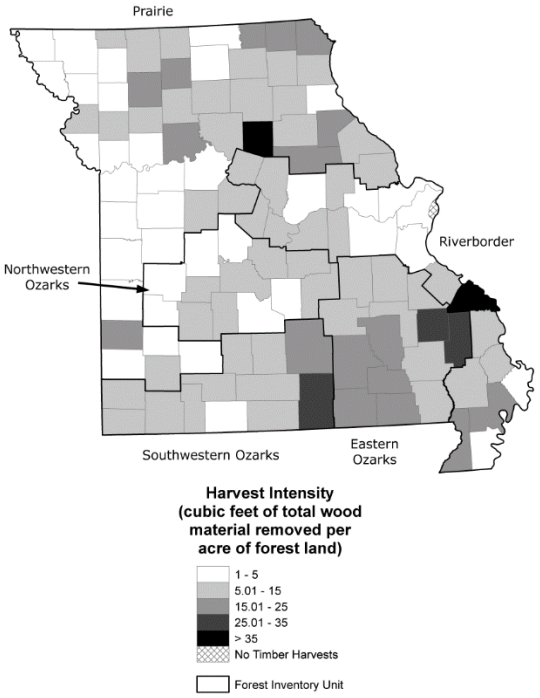


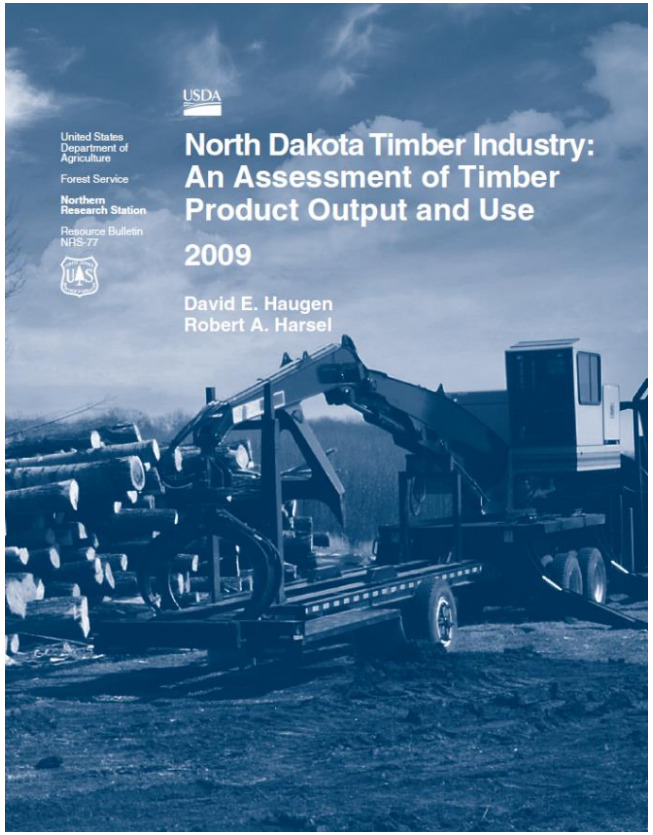
USDA United States Department of Agriculture

National Pulpwood Production, 2010

Ronald J. Piva
James W. Bentley
Steven W. Hayes

Forest Service | Northern Research Station | Resource Bulletin NRS-xx | May 2014





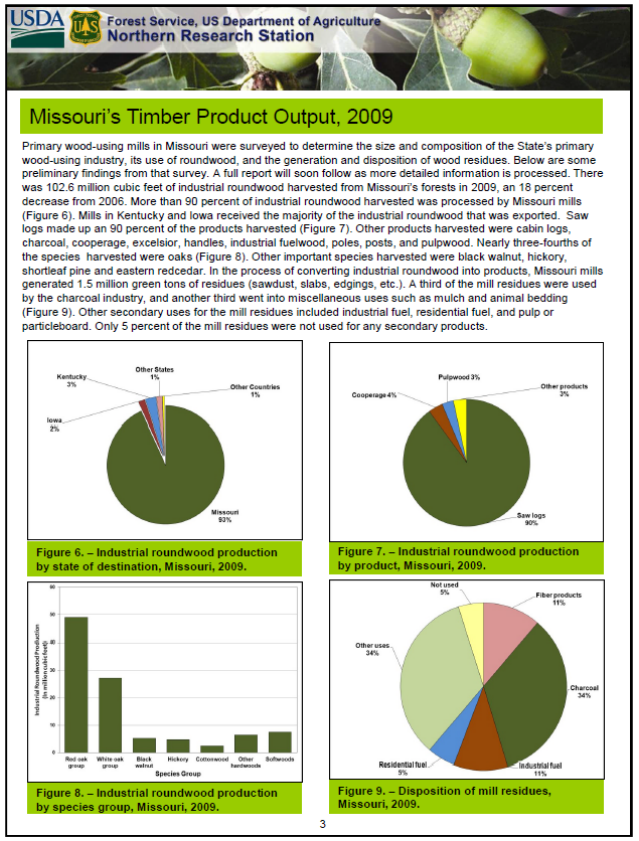
USDA

United States Department of Agriculture
Forest Service
Northern Research Station
Resource Bulletin NRS-77

North Dakota Timber Industry: An Assessment of Timber Product Output and Use

2009

David E. Haugen
Robert A. Harsel



USDA Forest Service, US Department of Agriculture
Northern Research Station

Missouri's Timber Product Output, 2009

Primary wood-using mills in Missouri were surveyed to determine the size and composition of the State's primary wood-using industry, its use of roundwood, and the generation and disposition of wood residues. Below are some preliminary findings from that survey. A full report will soon follow as more detailed information is processed. There was 102.6 million cubic feet of industrial roundwood harvested from Missouri's forests in 2009, an 18 percent decrease from 2006. More than 90 percent of industrial roundwood harvested was processed by Missouri mills (Figure 6). Mills in Kentucky and Iowa received the majority of the industrial roundwood that was exported. Saw logs made up an 90 percent of the products harvested (Figure 7). Other products harvested were cabin logs, charcoal, cooperage, excelsior, handles, industrial fuelwood, poles, posts, and pulpwood. Nearly three-fourths of the species harvested were oaks (Figure 8). Other important species harvested were black walnut, hickory, shortleaf pine and eastern redcedar. In the process of converting industrial roundwood into products, Missouri mills generated 1.5 million green tons of residues (sawdust, slabs, edgings, etc.). A third of the mill residues were used by the charcoal industry, and another third went into miscellaneous uses such as mulch and animal bedding (Figure 9). Other secondary uses for the mill residues included industrial fuel, residential fuel, and pulp or particleboard. Only 5 percent of the mill residues were not used for any secondary products.

Figure 6. – Industrial roundwood production by state of destination, Missouri, 2009.

Figure 7. – Industrial roundwood production by product, Missouri, 2009.

Figure 8. – Industrial roundwood production by species group, Missouri, 2009.

Figure 9. – Disposition of mill residues, Missouri, 2009.

3

Urban TPO Products?

Urban TPO Survey

THE URBAN WOOD BOOK

Urban Wood Waste:

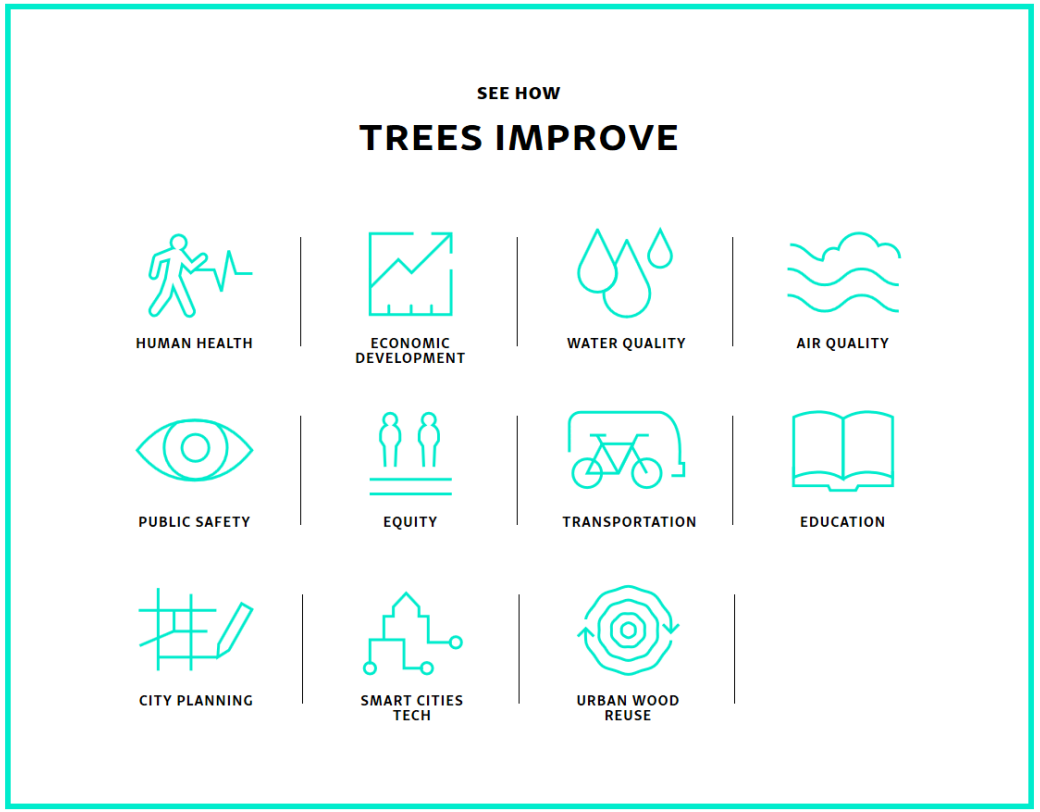
What
Who
Where
When
Why
How

- Count
- Generate
- Salvage
- Sort
- Process
- Produce
- Consume

Vibrant Cities Lab

Vibrant Cities Lab - website

- Research, resources, and guide for putting trees to work in a community **(urban forestry information clearinghouse)**
  1. Research & Case Studies
  2. Urban Forestry Toolkit

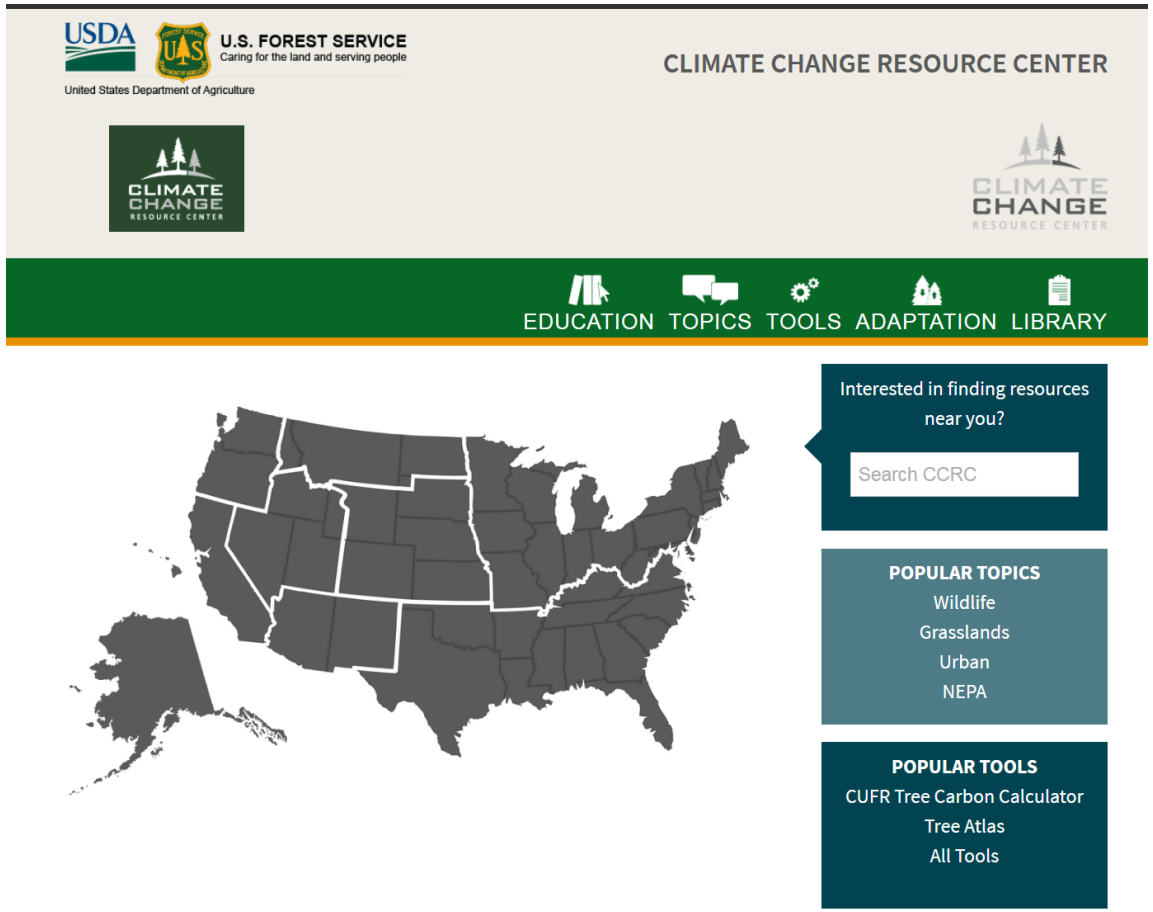

SEE HOW
TREES IMPROVE
HUMAN HEALTH
ECONOMIC DEVELOPMENT
WATER QUALITY
AIR QUALITY
PUBLIC SAFETY
EQUITY
TRANSPORTATION
EDUCATION
CITY PLANNING
SMART CITIES TECH
URBAN WOOD REUSE

Urban Forestry Toolkit
The U.S. Forest Service Step-by-Step Guide to Implementing Urban Forestry in Your Community
Assess
Prioritize
Organize
Plan
Build
Sustain
1 Begin With Urban Tree Canopy
2 Street Tree Inventory
Urban forests are forests for people
SHARE
SAVE
They provide real, measurable benefits to your residents and your neighborhoods. Dozens, even hundreds, of communities have developed plans to grow their urban

Climate Change Resource Center

Climate Change Resource Center - website

- Research, resources, and guide about climate change effects on forests **(climate change & forestry info clearinghouse)**



Urban Forests and Climate Change

Versión en español

Overview | **Synthesis** | **Reading** | **Research** | **Tools** | **Links**

Overview:
Healthy trees and forests provide communities with a host of climate-related benefits. Active planning, management, and care of the urban forest can improve its resilience to climate change and help cities and communities better adapt.

Follow the tabs to learn more about this topic.

Printer-friendly version

Wrap-Up & Discuss

Major Takeaways

- STEW-MAP: it is often the case that we vastly underestimate the number of organizations working in a city (or across a given landscape); it can be revealing to learn which organizations are most influential; and we can visualize stewardship capacities and gaps over time.
- UTC: often, the most opportunity for increasing tree canopy cover exists on privately owned land
- i-Tree: trees provide lots of benefits! If you need help demonstrating this, i-Tree can help
- Urban FIA: strategic national-level inventory on public/private lands, integrates with (rural) FIA, to support strategic management at a larger level
- Vibrant Cities Lab & Climate Change Resource Center – great information resources!

Consider your goals, and use one or more of these tools

to improve quality of life for all through efficient, effective, and equitable natural resource management

Where to learn more

- STEW-MAP:
  - https://www.nrs.fs.fed.us/urban/monitoring/stew-map/
  - General Technical Report: https://www.nrs.fs.fed.us/pubs/50447
- UTC:
  - https://www.nrs.fs.fed.us/urban/utc/
  - Video: https://youtu.be/4WElnUeYXRo
- i-Tree:
  - https://www.itreetools.org/
  - Videos: https://www.itreetools.org/resources/videos.php
- Urban FIA
  - https://www.nrs.fs.fed.us/fia/urban/
- Vibrant Cities Lab:
  - http://www.vibrantcitieslab.com/
- Climate Change Resource Center:
  - https://www.fs.usda.gov/ccrc/

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