



Session 2.3

Castle in the Sky: Creating and sharing new knowledge and supporting education on equitable access to ecosystem services

Chair: Wendy Chen



**World Forum on
Urban Forests**



2nd World Forum on Urban Forests

Washington DC, 2023

Accessible Urban Forestry Education

Introducing the FAO e-Learning 'Introduction to Urban and Peri- Urban Forestry'



Presented by

Lotte Dijkstra

Newcastle University | Studio PLACES

in collaboration with FAO | FAO eLearning Academy | SISEF | MD2 | EFI | EFUF





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Washington DC, 2023

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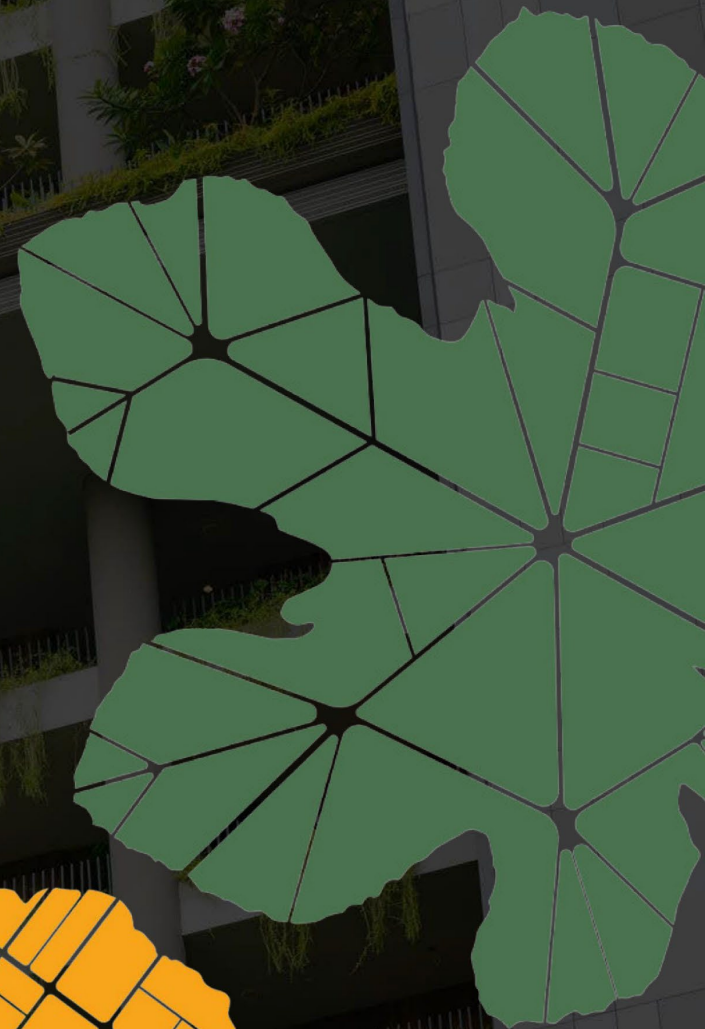
FAO eLearning Academy



Background

The potential

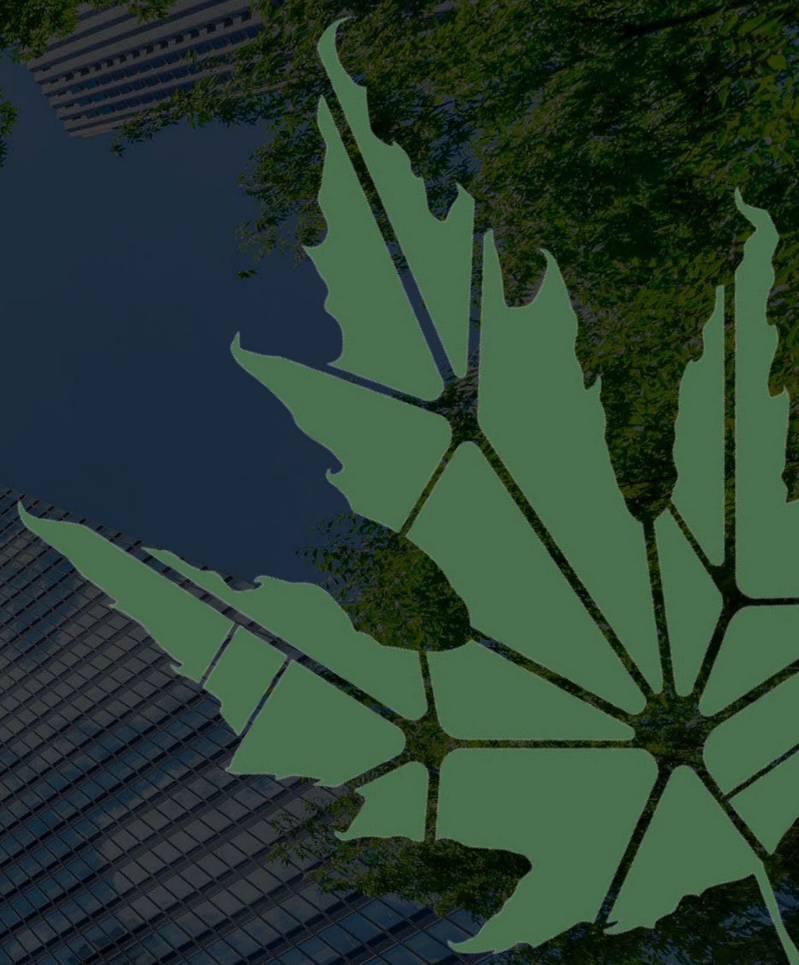
- Healthy, inclusive and resilient cities
- Planning, design and management for sustainable, resilient landscapes



Background

The challenge

- **Ensuring potentials are reached**
- **Embedding urban forest thinking**
- **Reaching new partners and stakeholders**

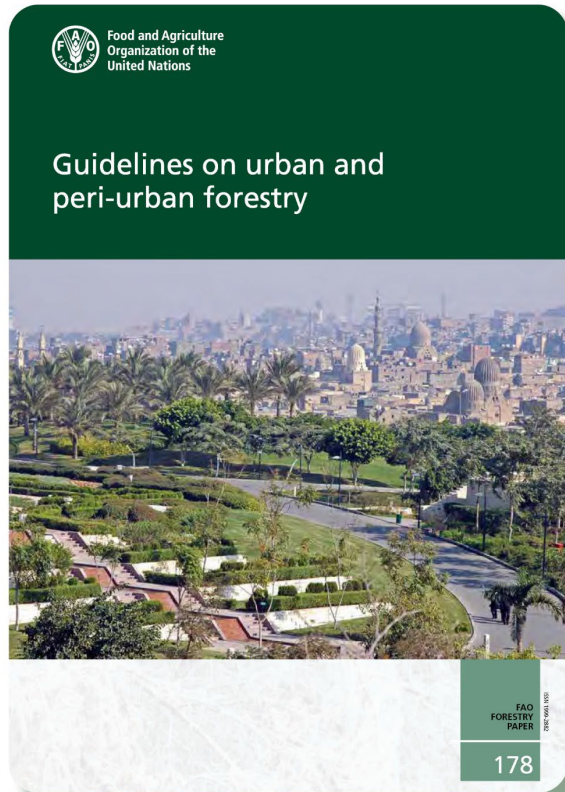




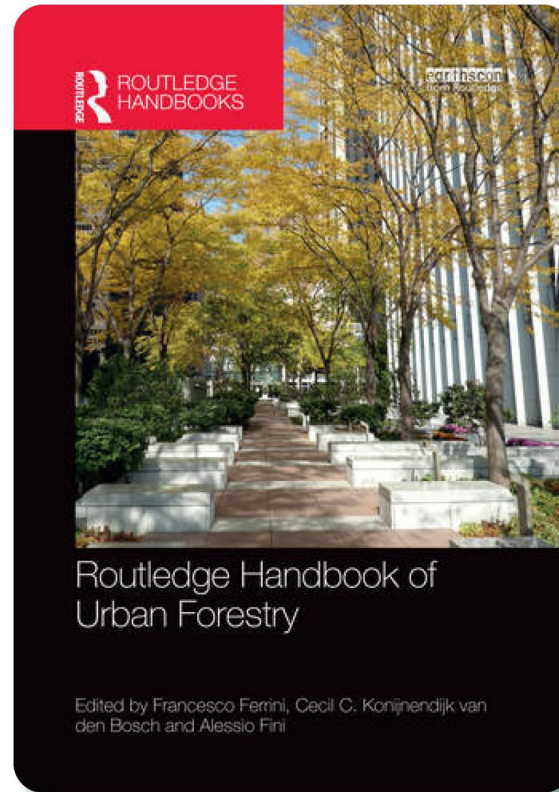
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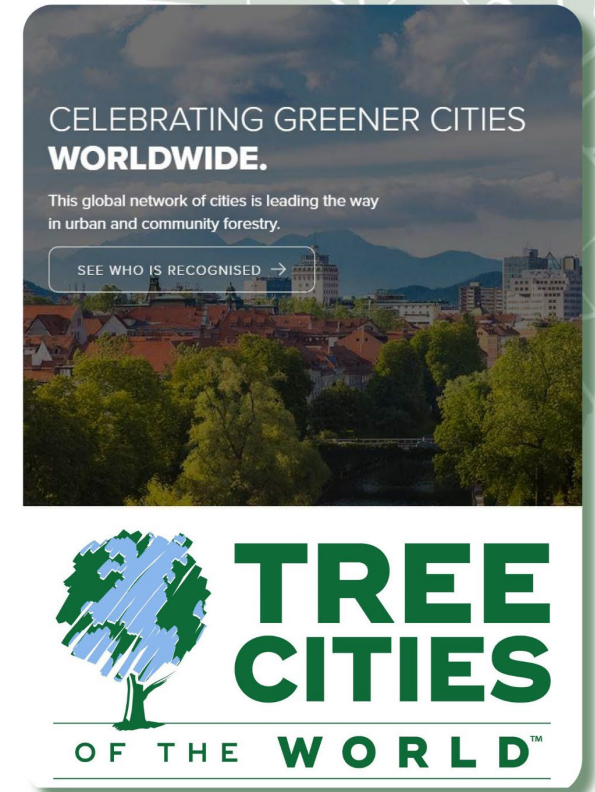
Body of knowledge



2016



2017



2018



Conversation starters

- **What are the challenges for urban forestry?**





Conversation starters

- **What are the challenges for urban forestry?**
- **Who should participate in the planning, design and management?**





Conversation starters

- **What are the challenges for urban forestry?**
- **Who should participate in the planning, design and management?**
- **What are the benefits?**





Conversation starters

- **What are the challenges for urban forestry?**
- **Who should participate in the planning, design and management?**
- **What are the benefits?**
- **What is urban forestry?**



An aerial photograph of a village with small, simple houses and lush green trees. On the right side of the image, there is a large, stylized graphic of a green leaf with a black outline of its veins. A smaller, yellow leaf graphic is positioned above it, with a green stem-like line connecting them.

Goals

Global, inclusive and accessible

- Level playing field
- Skills–based learning
- Accessible material



Level playing field

- **Vast array of disciplines and professional backgrounds**
- **Personal background**
- **Global context**
- **Local reality**





Introduction to Urban and Peri-Urban Forestry

Who should take this course?

This course is primarily intended for **individuals responsible for planning, designing, or managing urban forests**, including those working in **public or private organizations** and those in the **voluntary sector**. This may include:

*Click on each person to learn
about their interest in this course*



Policymakers



**Development
organizations and
voluntary sector**



**Planners, researchers
and practitioners**



Landowners and trusts

I work for a trust, which manages areas of urban land which include many trees. I would like to better understand how our work can contribute to a coherent urban forest strategy in our city, and that we can play a role as stakeholders in the process.



Skills-based learning

- **Introduction to urban forestry**
- **Directly applicable and practical skills**
- **Focus on what, how, why**
- **Invitation for further exploration**





Accessible material

Content:

- **Learner backgrounds**
- **Learning styles**
- **Global representation**





Accessible material

Content:

- **Learner backgrounds**
- **Learning styles**
- **Global representation**

Infrastructure:

- **Free of charge**
- **Sensitive to available time**
- **Access to internet**
- **Open access resources**



Approach

FAO eLearning Academy

4 QUALITY
EDUCATION



- Targeted, learner-centred design
- Interdisciplinary team
- Peer review
- Assessment and certification





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Creators



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Peer review



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FAO eLearning Academy

Peer review



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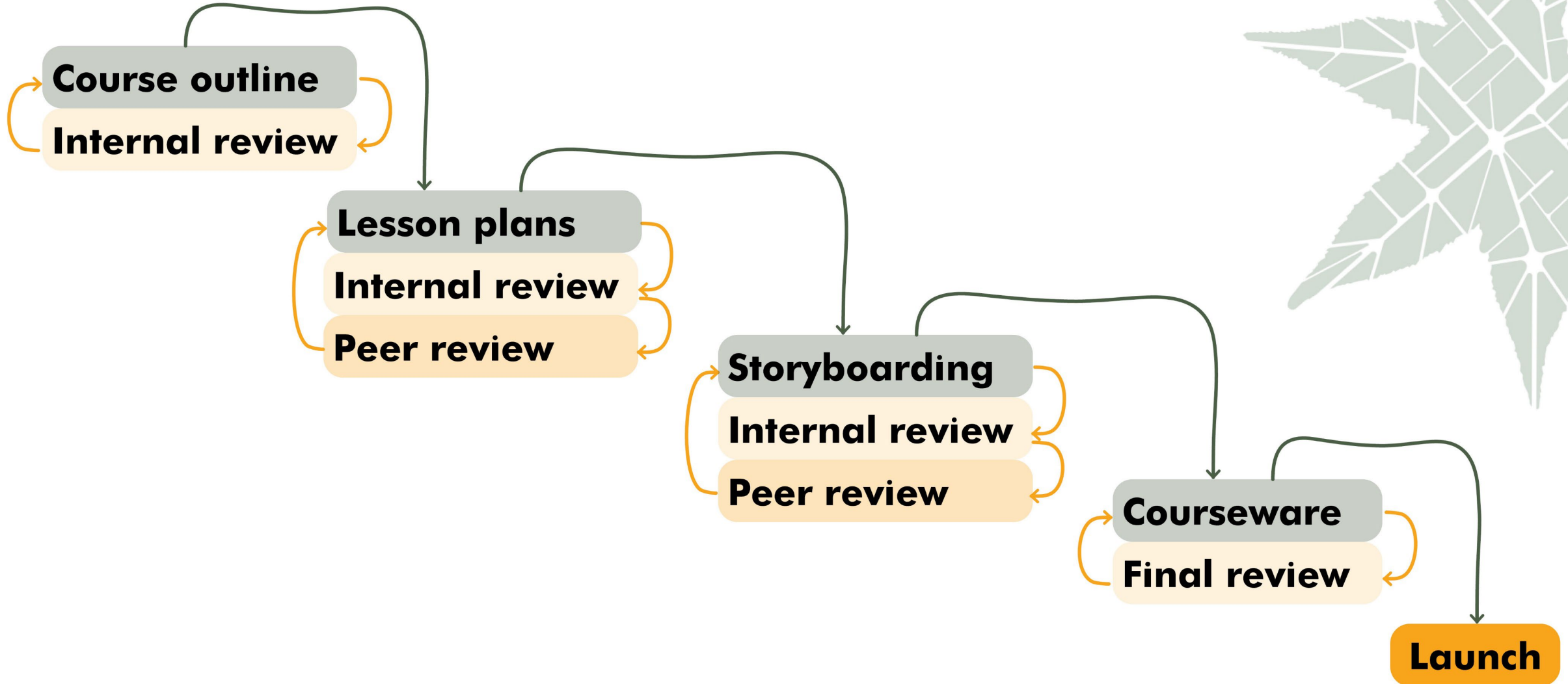
C.Y. Jim
Education University of
Hong Kong [EdUHK]



Thomas B. Randrup
Swedish University of
Agricultural Sciences



Process



Self-paced elearning course

Introduction to urban and peri-urban forestry

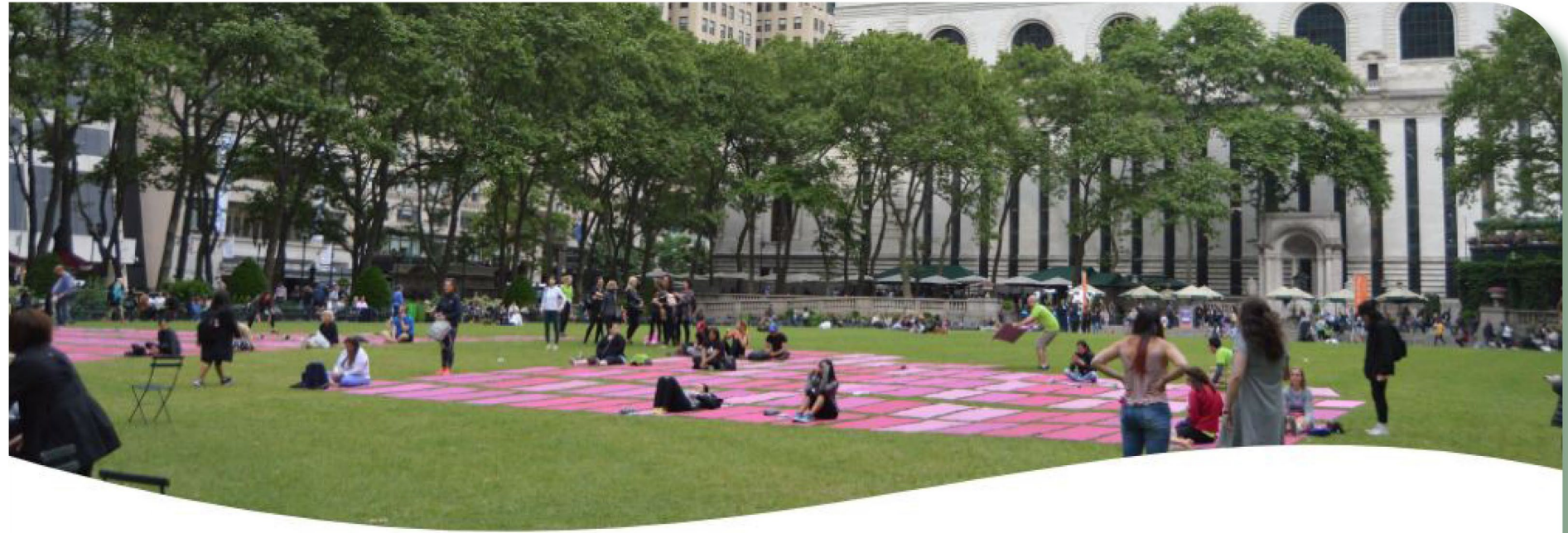
- 1. Introduction and basic concepts**
- 2. Why urban forests are important**
- 3. Who is involved in the planning, design and management of urban forests**
- 4. Urban forestry challenges in a changing world**





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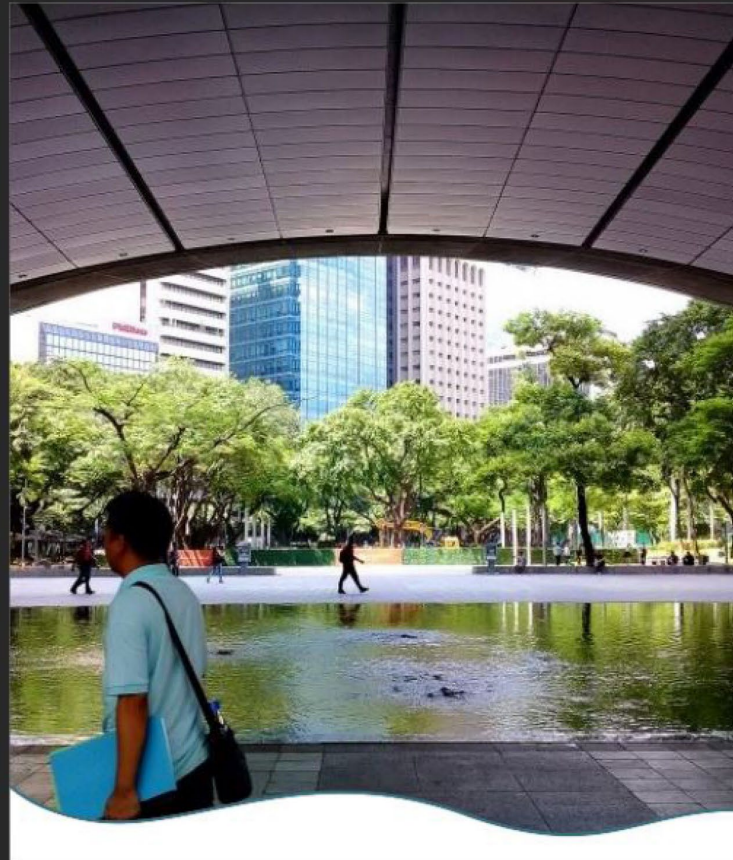
About this course

Welcome to this course on Urban Forestry

This e-learning course aims to provide an **introductory** and **elementary understanding** of **urban** and **peri-urban forestry** concepts. It focuses on issues around definitions and introduces ideas around the planning, design and management of urban and peri-urban forests.



1. Learning objectives
2. Introduction
3. What is urban forestry?
4. Benefits of urban forests
5. Five types of urban forest
6. Test your knowledge
10. Planning, design and management of urban forests
7. The relationship between urban and peri-urban forests
9. Are inner forests recognizably forested areas?
10. Differences between urban and faraway forests
11. Test your knowledge



An introduction to Urban and Peri-Urban Forestry

Introduction and basic concepts

1

Welcome to Lesson 1.

This lesson provides an overview of urban forestry and the importance of urban forests for sustainability.

It provides a foundation, with key urban forestry concepts, and describes the relationship between urban forests and peri-urban forests adjacent to the city.



30 minutes

< Prev

Next >



1

Introduction and basic concepts

Learning objectives

At the end of this lesson, you will be able to:

- define urban forestry;
- explain **key terms** and **concepts** associated with urban forestry;
- describe the **process** of **planning, designing and managing** urban forests;
- explain the **relationship** between **urban forests** and **forests outside of urban contexts**;and
- describe the contribution of urban forests to the **UN Sustainable Development Goals (SDGs)**.





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1

Introduction and basic concepts

Introduction



Welcome! My name is Geetha. I work as an urban forestry consultant.

I will be guiding you through this course material, and you will be joined by Iciar and Alex here.





3 The planning, design and management of urban forests Community-led urban forestry

If urban forests are imposed on communities, they are likely to lead to negative feelings. The appreciation of trees in and around urban areas is highly dependent upon their **acceptability to local communities**, and working with communities at all stages increases the likelihood of success.

Enabling individuals to develop a **sense of ownership** of local trees improves the chances of reaching tree maturity and engaging people in the trees' protection and day-to-day maintenance.



Click to learn more about Karura Community Forest in Nairobi, Kenya





2

The importance of urban forests

Test your knowledge

24/26

Imagine you are working on redeveloping an existing community park.
Assign the following stakeholders to the appropriate quadrant:

	KEEP SATISFIED	MANAGE CLOSELY
High Influence	Local businesses	City urban planning department
Low Influence	Civil engineers	Local community

Stakeholders to be assigned:

- City urban planning department
- Local businesses
- Civil engineers
- Local community

Please select the answer(s) of your choice and click on Check answer

Check answer



4

Urban forestry challenges in a changing world

Moving on

Well, Iciar and Alex, we are at the end of the course now, and I hope it has deepened your understanding of urban forestry

It certainly has, Geetha. I am particularly interested in the long term benefits of urban forestry, and I'm keen to discuss with my colleagues how we can ensure our urban forest management plans include long term plans and monitoring and evaluation throughout.

Yes, thank you Geetha! I now understand the importance of the community for a successful urban forest strategy, and the benefits of urban forests for the community. I will discuss this with the local communities I work with.



Launching soon!

Introduction to urban and peri-urban forestry



elearning.fao.org





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New
 Certification
 Mobile-Friendly



NEW

Minimum dietary diversity for women

SEPTEMBER 2023 1 h 40 m



NEW

Planning seed and seedling supply for forest and landscape restoration

SEPTEMBER 2023 2 h



NEW

Bivalve Mollusc Sanitation: Growing Area Monitoring

SEPTEMBER 2023 2 h 30 m



NEW

Mitigating the impact of irrigation infrastructure on fish migration

SEPTEMBER 2023 2 h 30 m



Invite your local...

- **Polymakers**
- **Government officials**
- **Development organizations**
- **Volunteers**
- **Not-for-profit organizations**
- **Planners**
- **Researchers**
- **Practitioners**
- **Landowners**
- **Trusts**
-

Dissemination kit:

- **Invitation letter**
- **Abstract for each lesson**
- **Direct link to course**

Reach out to:

C.M.Dijkstra2@newcastle.ac.uk





Thank you

Lotte Dijkstra | Newcastle University | Studio PLACES

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 **@studio.places**

 **@studio_places**



Food and Agriculture
Organization of the
United Nations



Arbor Day
Foundation



2nd **World** **Forum on** **Urban** **Forests**

2023



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*Parallel Sessions - Anacostia D/E: Session 2.3:
Castle in the Sky: Creating and sharing new knowledge and
supporting education on equitable access to ecosystem
services. Chair: Wendy Chen*

LOCAL GOVERNANCE MODELS ABOUT COMMUNITY PARTICIPATION IN BUENOS AIRES, ARGENTINA



Presented by

Dra. Ing. Elena B. Craig

Ing. Ana lía Scarselletta

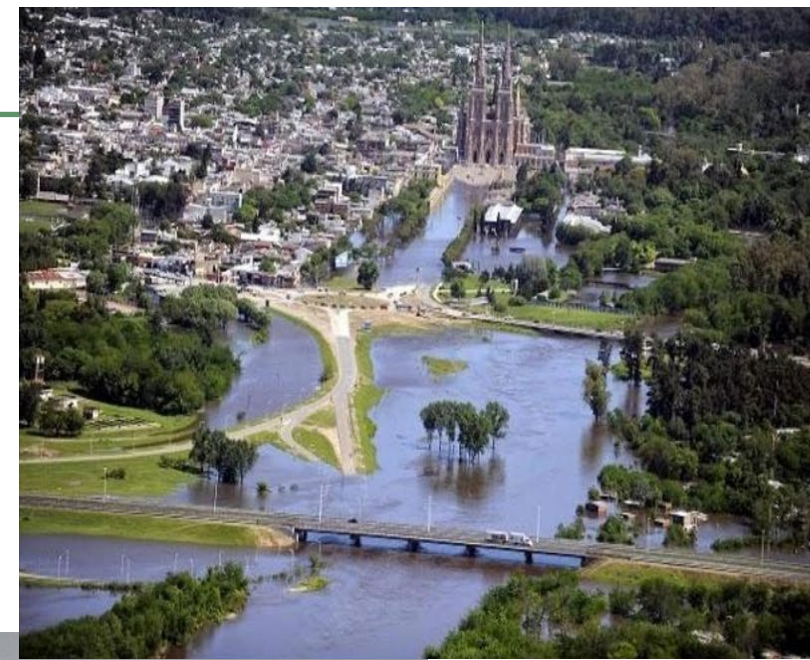
Dra. Clara Minaverry

Lic. Macarena Pocaressi



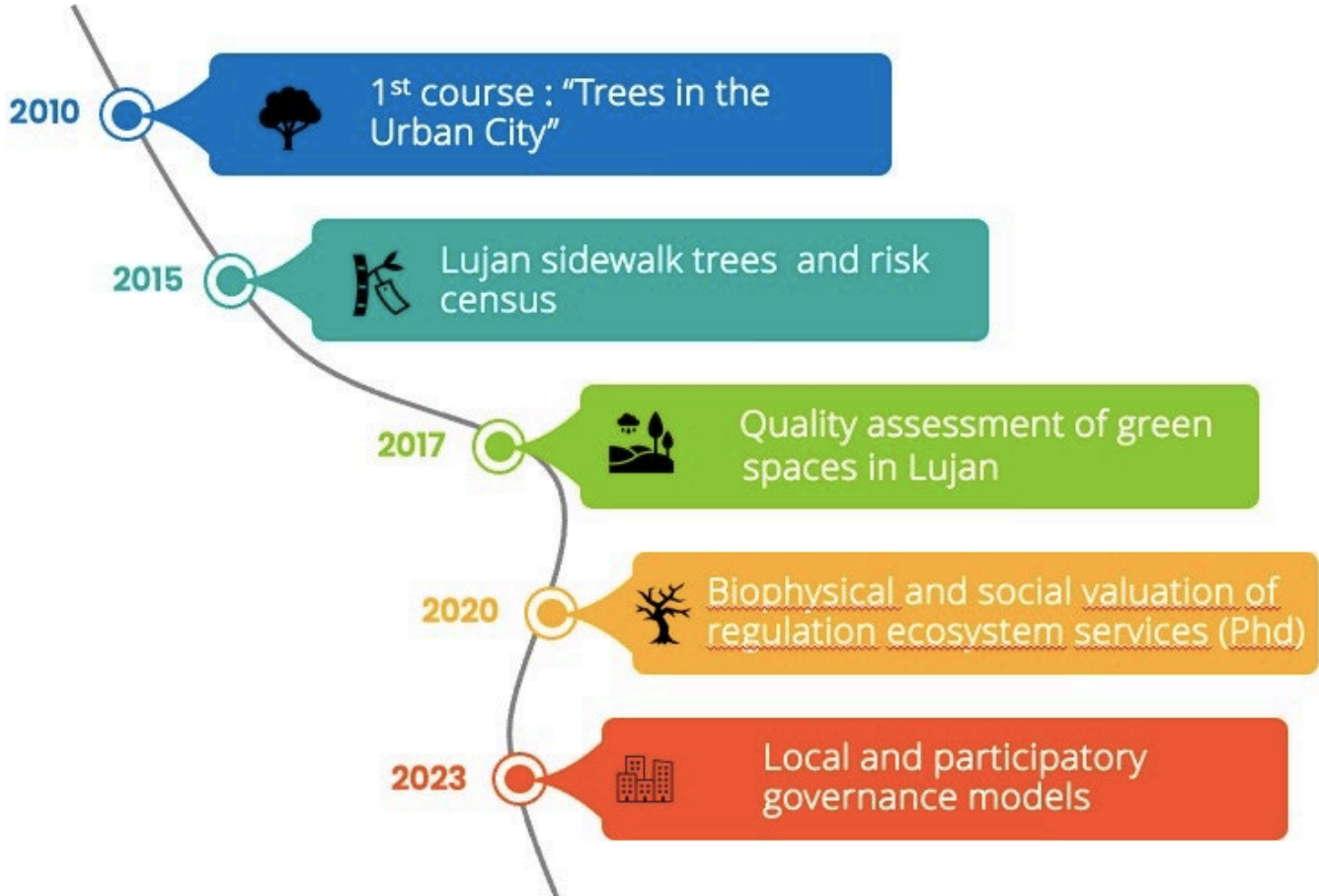


Understanding our workspaces



Environmental and Social Vulnerability

Our experience in urban forest



Paint: Blue Forest



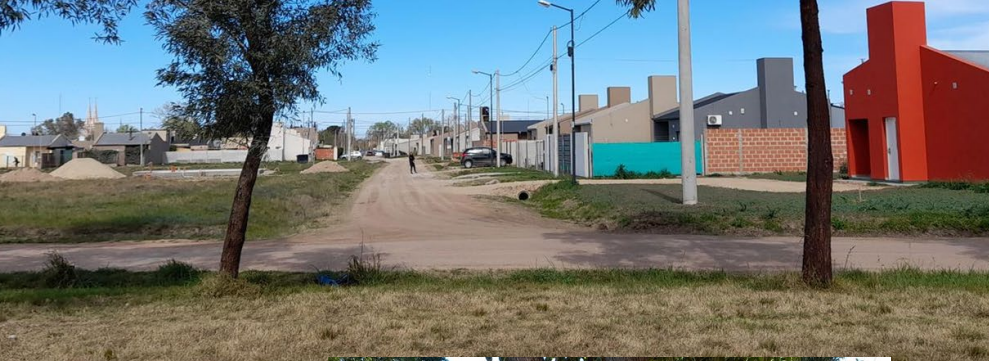
New Urban Developments: The Consequences of Neglecting Green Infrastructure Planning



Why do we find this?

What's the role of local
government?

What's the role of
neighbors?



Changes in
the land use





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Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean



- To access to environmental information
- To participate about environmental decision
 - To access to environmental justice
 - To protect environmental defenders

Legally, local governments are responsible for developing and overseeing the urban forest plan. However, these regulations were enacted without taking in consideration the participation of the community.



	Luján			Bahía Blanca					
	Ord. 176	Ord. 5.997	Ord. 4.294	Ord. 14.577	Ord. 14.966	Ord. 15.523	Ord. 16.190	Ord. 18.371	Ord. 19.318
1.	X		X	X	X	X	X	X	X
2.									
3.				X		X	X		
4.						X		X	
5.									
6.			X			X			X

	Ituzaingó		Mercedes		
	Ord. 2.013	Ord. 7.792	Ord. 8.120	Ord. 8.256	Ord. 8.260
1.	X	X	X	X	X
2.					
3.	X	X	X	X	
4.	X		X	X	
5.					
6.	X	X	X	X	

- 1- PRESERVATION, CONSERVATION, RECOVERY AND IMPROVEMENT MECHANISMS
- 2- SOCIAL PARTICIPATION
- 3- BIODIVERSITY CONSERVATION
- 4- ENVIRONMENTAL EDUCATION
- 5- FREE ACCESS TO INFORMATION
- 6- MINIMAL PLANE RISKS

de minimización de riesgos. Elaboración propia, 2020.

Environmental Protection mechanisms detected in Local Ordinances



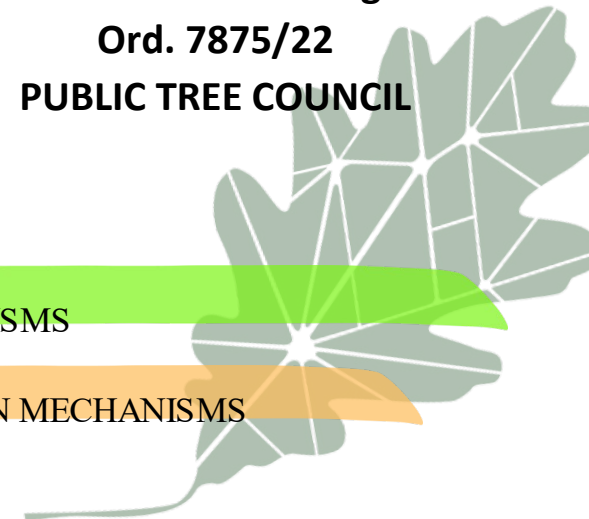
NOV. 2022- LUJÁN

a new municipal ordinance was enacted that considers an instance of social participation in decision-making
Ord. 7875/22
PUBLIC TREE COUNCIL

Scarselletta, A.; Minaverry, C.; Pocaressi, M; López, M. y Cucciuffo, E. (2021) MECANISMOS LEGALES PARA LA PROTECCIÓN AMBIENTAL DE LOS BOSQUES URBANOS EN CUATRO MUNICIPIOS DE LA PROVINCIA DE BUENOS AIRES, en Papeles del Centro de Investigaciones, Facultad de Ciencias Jurídicas y Sociales, UNL, publicación 10, número 22, Santa Fe, República Argentina, pp. 10-26.

SOCIAL PARTICIPATION MECHANISMS

ENVIRONMENTAL EDUCATION MECHANISMS



Exploring the role of Local Communities in Urban Governance

METHODOLOGY

20 SPECIALIST
INTERVIEWS



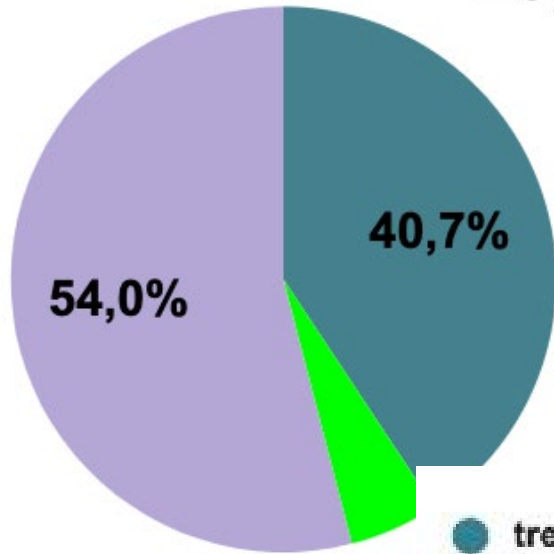
790 COMMUNITY
SURVEY



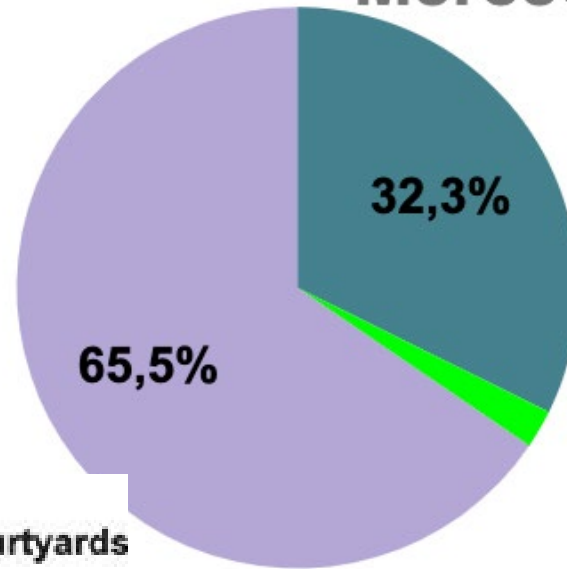


Identifying the Tree that holds the closest connection to you

Luján



Mercedes

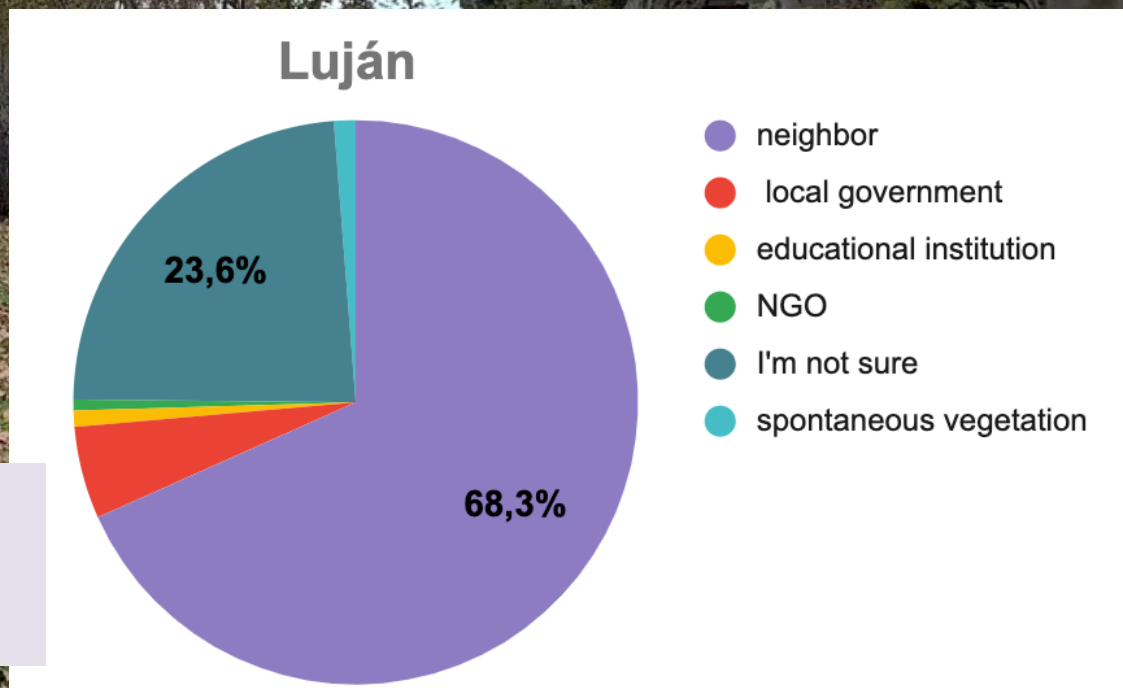
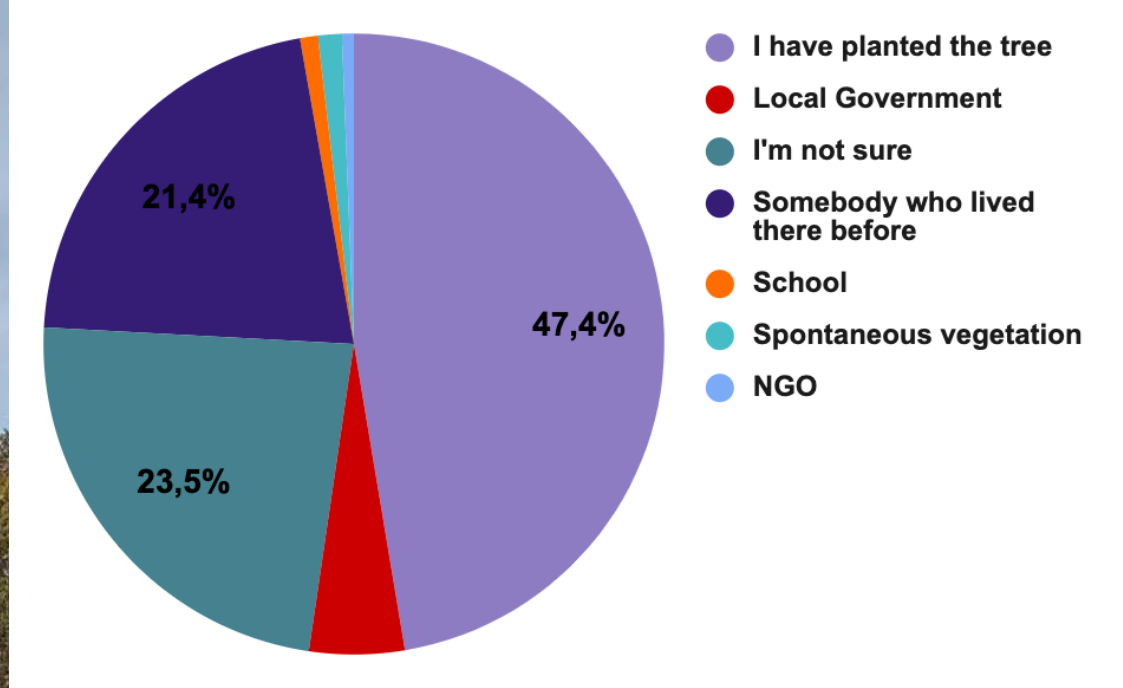


- trees in private courtyards
- trees in public parks
- trees on the sidewalk





Who has planted the trees in your sidewalk?



Neighbors perceptions about ecosystem services



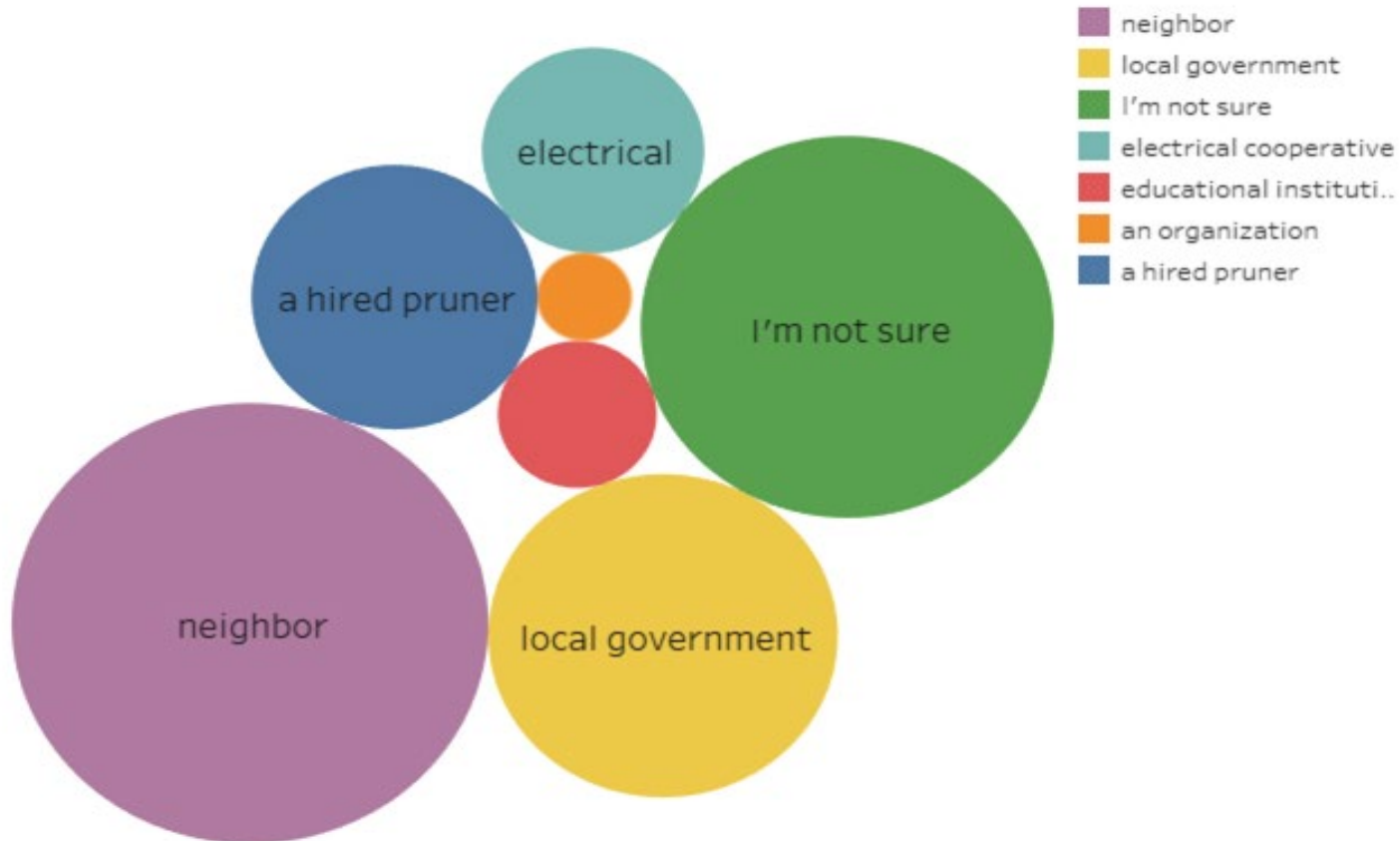
Of the bare forests
Juan Carlos Brambiya



Paint: White forest, black root



Who plays a role of taking care for trees, and what aspects do local community value about them?

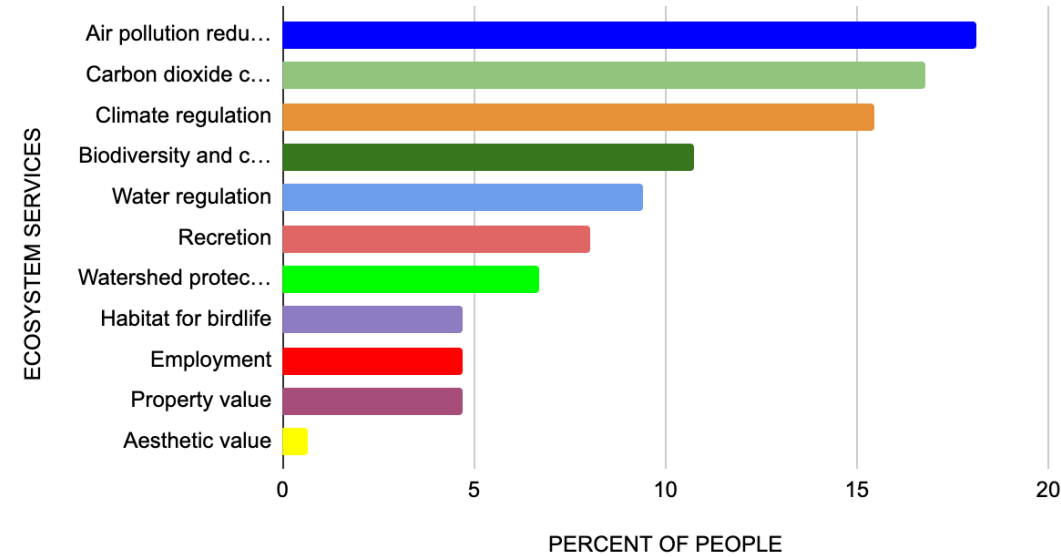




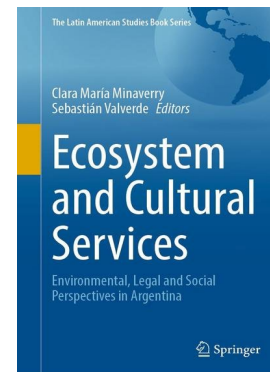
Approach about local perception of ecosystem



ECOSYSTEM SERVICES IN BOGOTA



Scarselletta A.; Craig, E. REGULATORY ADVANCES AND SOCIAL PERCEPTION OF THE ECOSYSTEM SERVICES PROVIDED BY URBAN FORESTS IN THE MUNICIPALITY OF LUJAN, PROVINCE OF BUENOS AIRES, ARGENTINA.2021. Ecosystem and Cultural Services: Environmental, Legal and Social Perspectives in Argentina. Springer. Eds. Sebastián Valverde y Clara María Minaverry.





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Interviews with urban forest specialists

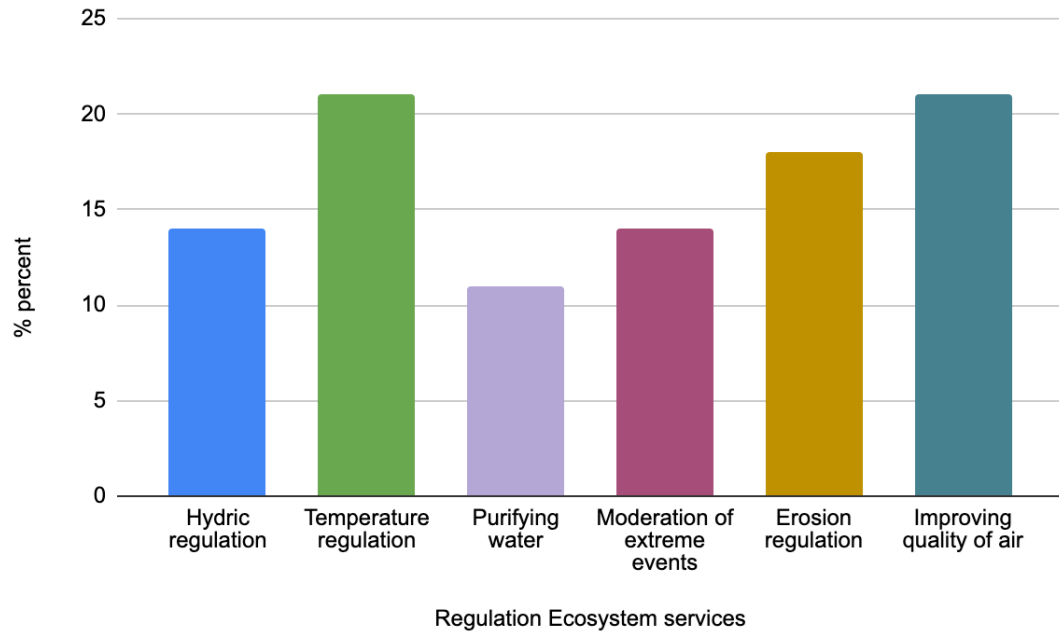


Fig. X.5: Average score for each of the regulation or sustainability services offered by urban forests. (1 means "It does not contribute to the service" and 5 means "It successfully contributes to the service"). Key informants' responses; surveys conducted during 2019. Compiled by the authors

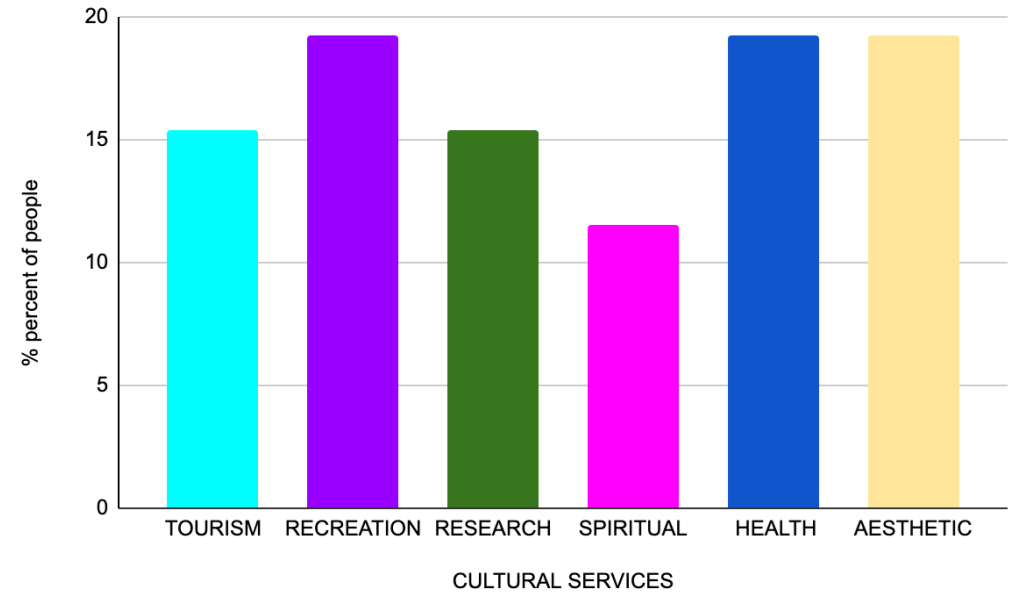
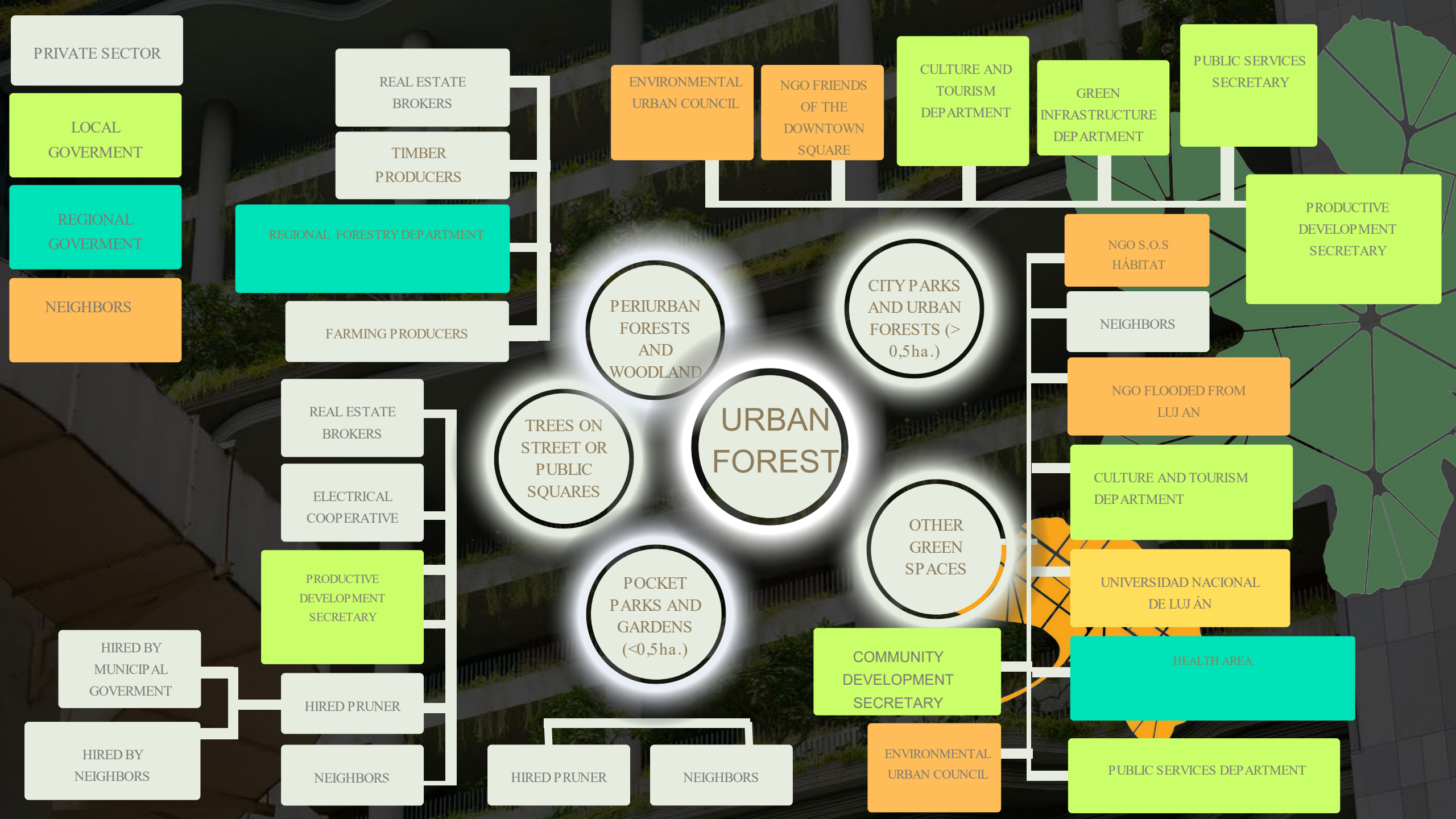


Fig. X.6: Average score for each of the cultural services offered by urban forests. (1 means "It does not contribute to the service" and 5 "It successfully contributes to the service"). Key informants' responses; surveys conducted during 2019. Compiled by the author

The urban forest model at the outset of this project





PRIVATE SECTOR

LOCAL GOVERNMENT

REGIONAL GOVERNMENT

NEIGHBORS

REAL ESTATE BROKERS

TIMBER PRODUCERS

REGIONAL FORESTRY DEPARTMENT

FARMING PRODUCERS

REAL ESTATE BROKERS

ELECTRICAL COOPERATIVE

PRODUCTIVE DEVELOPMENT SECRETARY

HIRED BY MUNICIPAL GOVERNMENT

HIRED PRUNER

HIRED BY NEIGHBORS

NEIGHBORS

PERIURBAN FORESTS AND WOODLAND

TREES ON STREET OR PUBLIC SQUARES

POCKET PARKS AND GARDENS (<0,5ha.)

HIRED PRUNER

NEIGHBORS

URBAN FOREST

CITY PARKS AND URBAN FORESTS (> 0,5ha.)

OTHER GREEN SPACES

COMMUNITY DEVELOPMENT SECRETARY

ENVIRONMENTAL URBAN COUNCIL

ENVIRONMENTAL URBAN COUNCIL

NGO FRIENDS OF THE DOWNTOWN SQUARE

CULTURE AND TOURISM DEPARTMENT

GREEN INFRASTRUCTURE DEPARTMENT

PUBLIC SERVICES SECRETARY

PRODUCTIVE DEVELOPMENT SECRETARY

NGO S.O.S HÁBITAT

NEIGHBORS

NGO FLOODED FROM LUJÁN

CULTURE AND TOURISM DEPARTMENT

UNIVERSIDAD NACIONAL DE LUJÁN

HEALTH AREA

PUBLIC SERVICES DEPARTMENT

CONCLUSION

Multi-criteria compensation mechanisms

Environmental education and professionalization of the sector

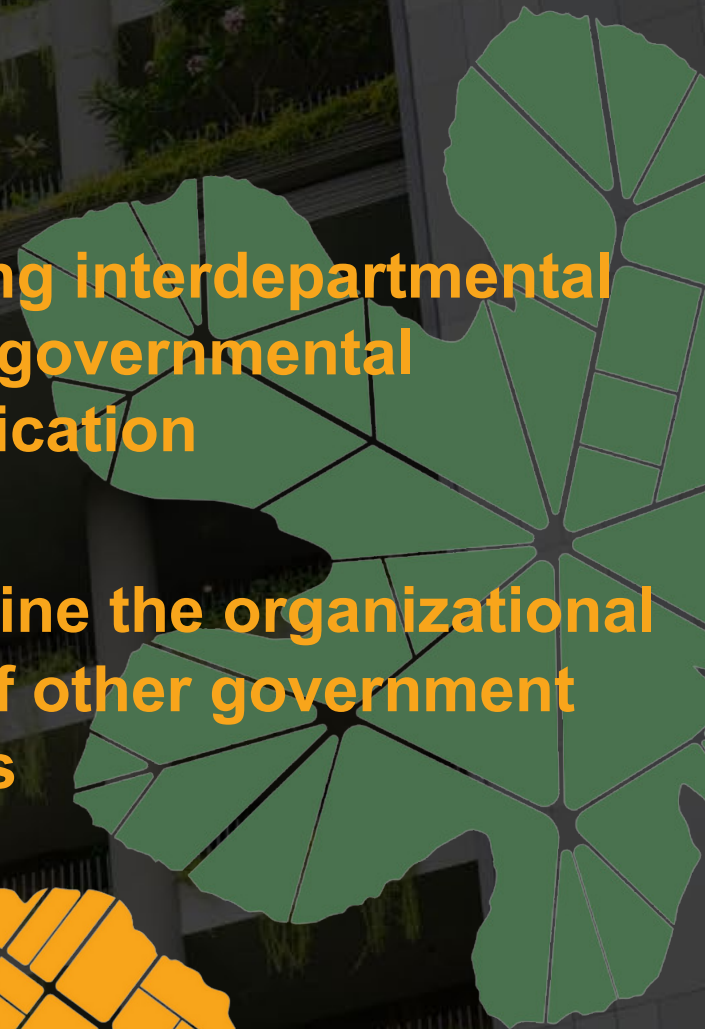
Improve the Mechanisms of participation and articulation between the actors involved

Greater local government involvement in Urban forest management with emphasis on sidewalk trees

Enhancing interdepartmental and intergovernmental communication

To examine the organizational charts of other government agencies

Ensure compliance with the law



Thank you

Dra . Elena B. Craig

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✉ dearbolesurbanos@gmail.com



Paint: "From forest". Lujan painter: Juan Carlos Brambilla
<https://brambiya.mitiendanube.com/productos>



Food and Agriculture
Organization of the
United Nations



Arbor Day
Foundation



POLITECNICO
MILANO 1863



International Society of Arboriculture



Smithsonian



FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE

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Forests

2023



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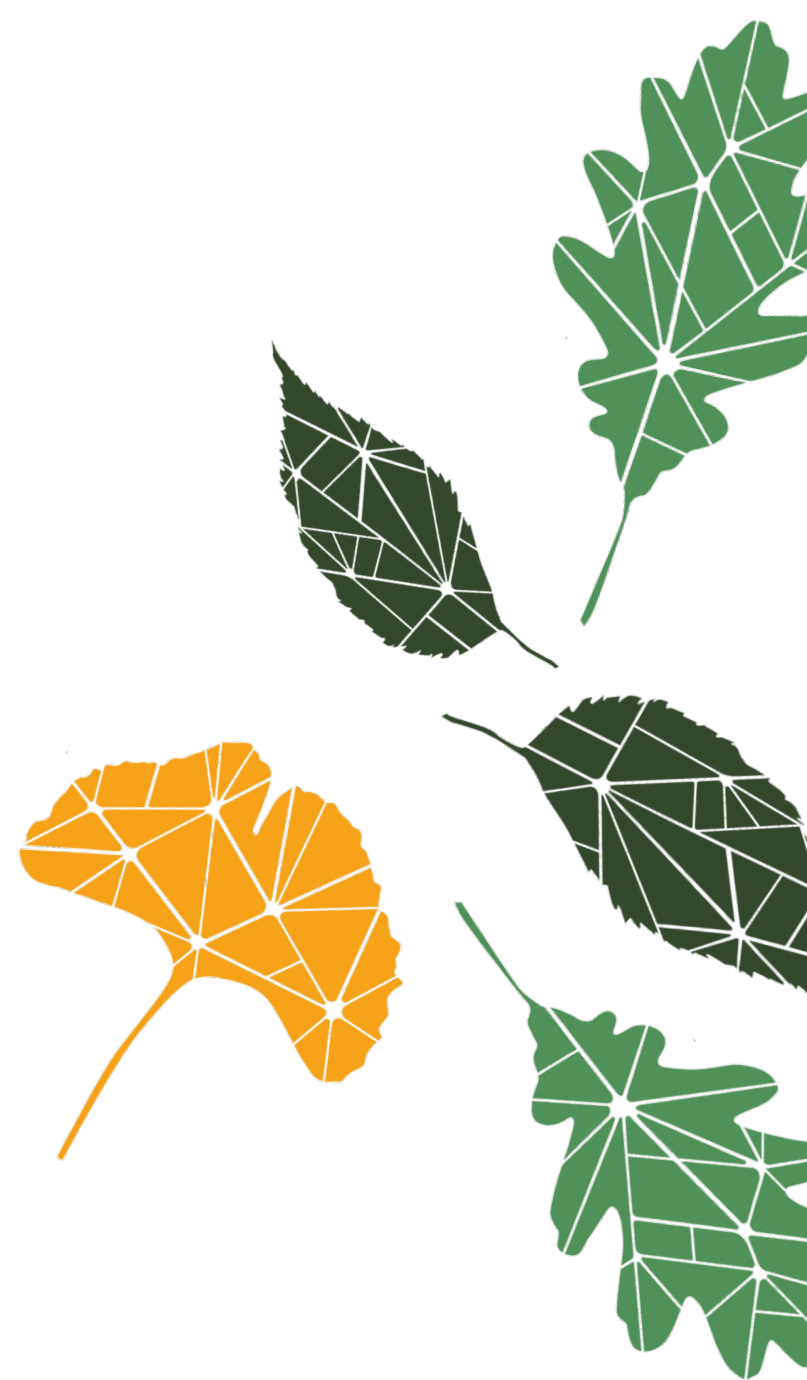
i-Tree 2023

More science and easier to use

Presented by

Jason Henning PhD

The Davey Institute





i-Tree 2023

www.itreetools.org

- Advancing and sharing the science of tree benefits since 2006
- A collection of free tools for estimating the benefits of trees
- Science based and continually updated
- Dedicated outreach and free technical support



Core individual tree tools



Core canopy tools



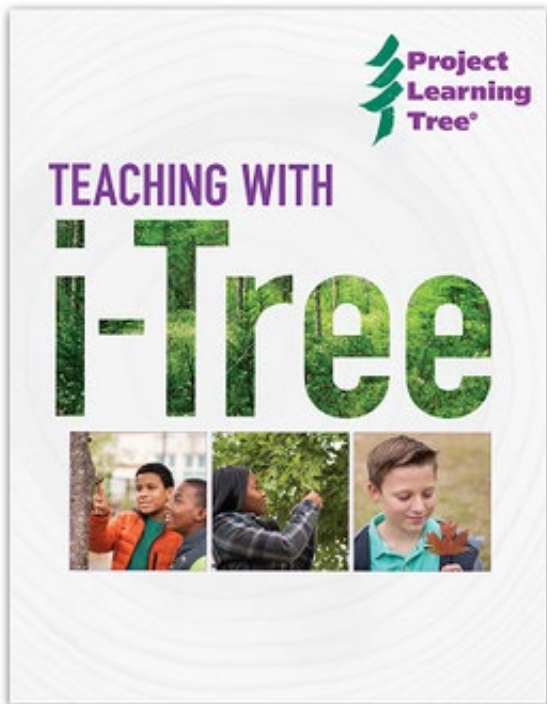
“Putting US Forest Service urban forest science into the hands of users”



Ways to use i-Tree

Education

- Connect students with trees
- Teach public about tree benefits
- Create engaged communities

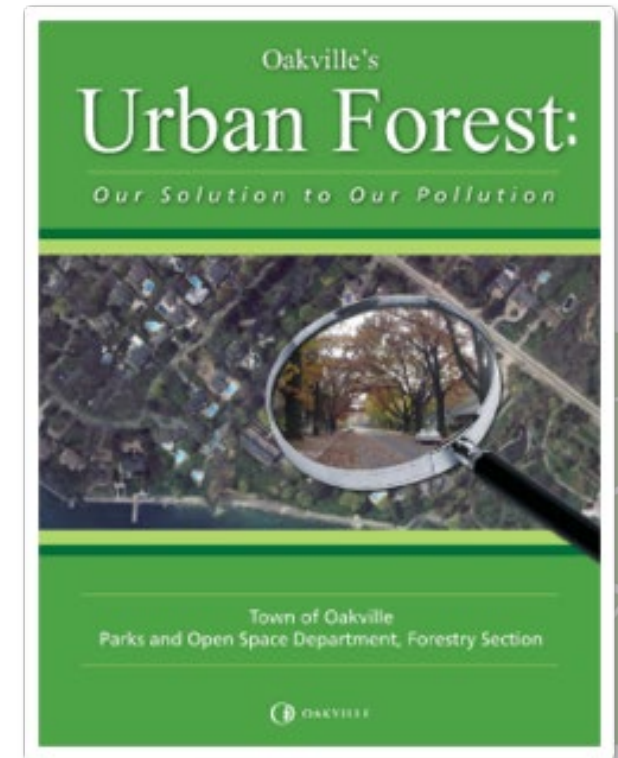


Advocacy

- Show policy makers the benefits of trees
- Create policy focused on maximizing tree benefits
- Convince doubtful audiences

Strategic Management

- Decide where to plant trees
- Support care, maintenance, and protection of trees
- Monitor and optimize investments in trees



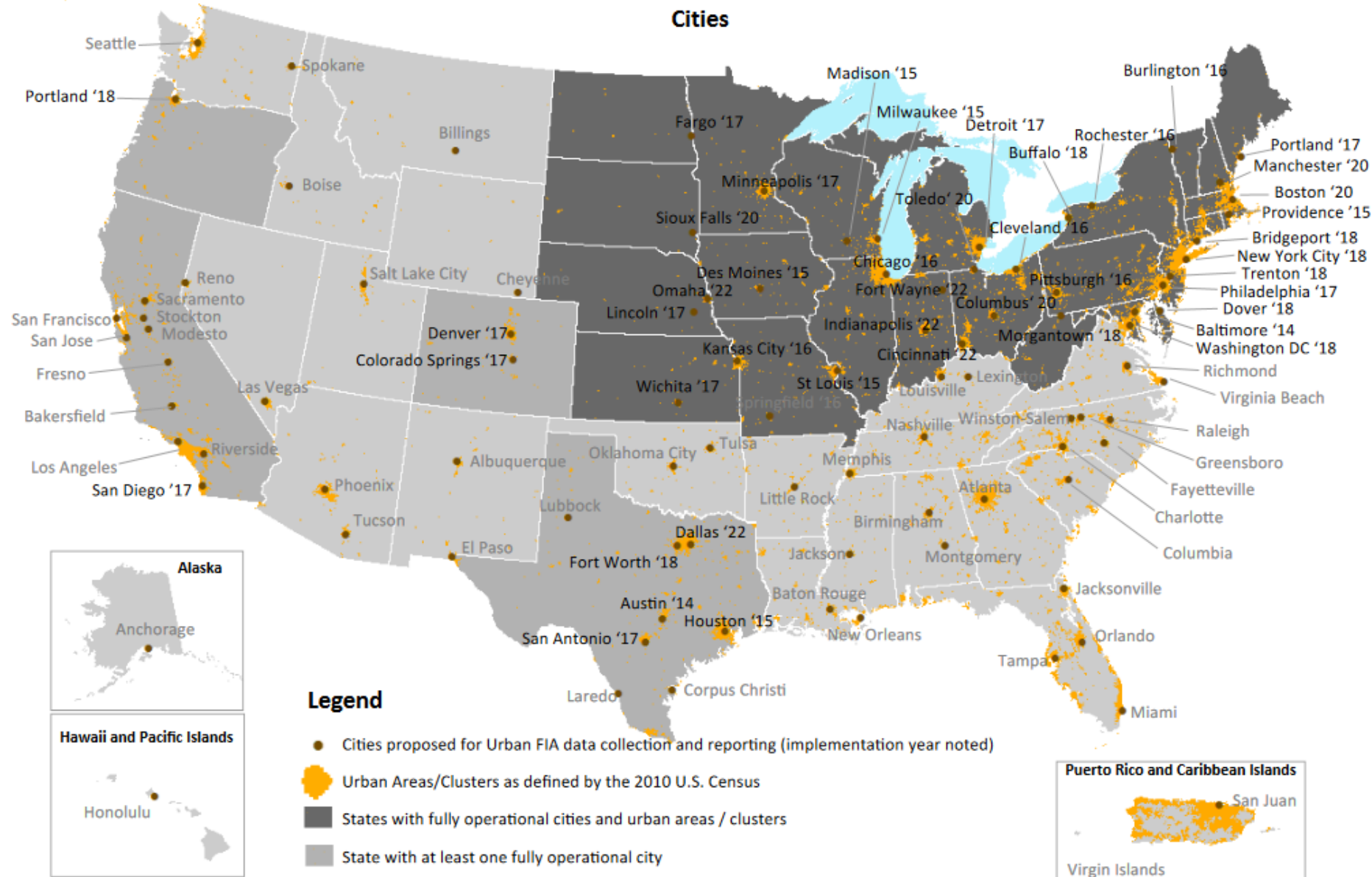


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U.S. Forest Service
Urban Forest Inventory & Analysis (FIA) 2023

Urban Forest Inventory & Analysis (FIA)
The Nation's Urban Forest Inventory



Springfield '16 initial cycle only, no remeasurement planned

Updated January 23



Key features of integration with FIA

- Use of i-Tree field methods and models
- High quality urban specific data to support new science
- Collaboration with FIA researchers
 - Urban Specific crown width equations
 - New biomass equations
 - Validation and testing



Urban Ecosystems (2020) 23:905–917
<https://doi.org/10.1007/s11252-020-00988-2>

Crown width models for woody plant species growing in urban areas of the U.S.



James A. Westfall¹ · David J. Nowak² · Jason G. Henning³ · Tonya W. Lister¹ · Christopher B. Edgar⁴ · Mark A. Majewsky⁵ · Nancy F. Sonti⁶

Published online: 19 March 2020

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Abstract

Crown widths of woody plant species growing in urban areas are of considerable importance as an overall indicator of health and also serve as an important factor for assessing leaf area and associated ecosystem services, such as carbon sequestration, air pollution removal, air temperature cooling, and rainfall interception. Unfortunately, assessing crown widths in urban environments is often challenging and time consuming. To help reduce data collection costs and provide consistency over time, models to predict crown widths for urban-grown species were developed using data from 49 cities across the U.S. and Southern Canada. The effort consisted of fitting mixed models for 29 species groups that encompassed 964 species. Cities were considered a random effect and were statistically significant for 22 of the 29 groups. The need for urban-specific crown width models was demonstrated via examination of prediction biases found when applying crown width models based on forest grown trees, where under-prediction up to about 20% was found for the same species growing in urban areas. Application of the models was evaluated by using crown width predictions instead of observed values for calculations of crown leaf area. Mean percent differences in leaf area were about $\pm 10\%$ across most species groups. Further improvements to national-scale urban crown width models should be pursued as additional data become available via i-Tree, Urban FIA, and possibly other sources where data collection protocols are compatible.

Keywords Ecosystem services · Forest inventory · Mixed models · Leaf area · Spatial trend



The Research Suite i-Tree's science incubator

Actively in-development tools,
available for use

<https://www.itreetools.org/tools/research-suite>

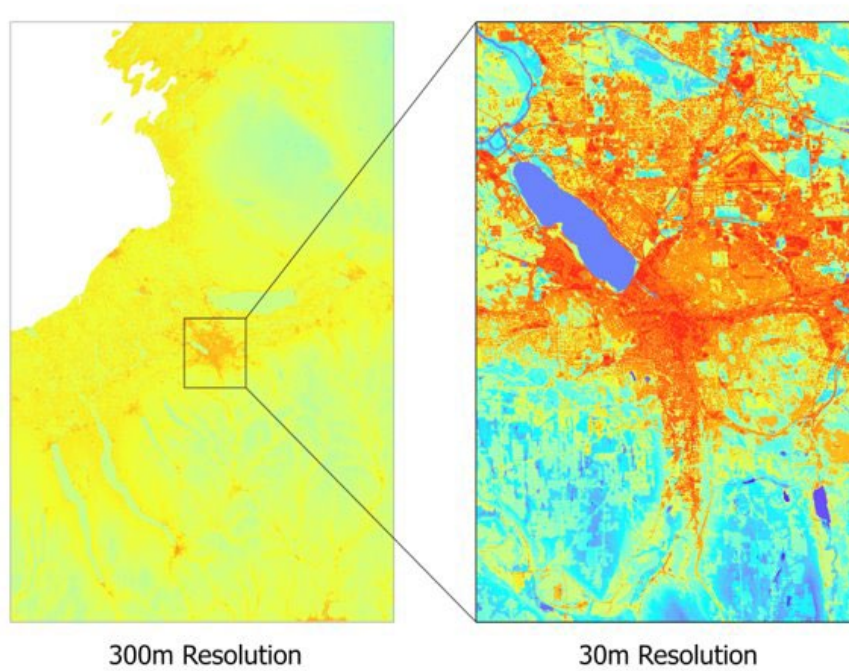
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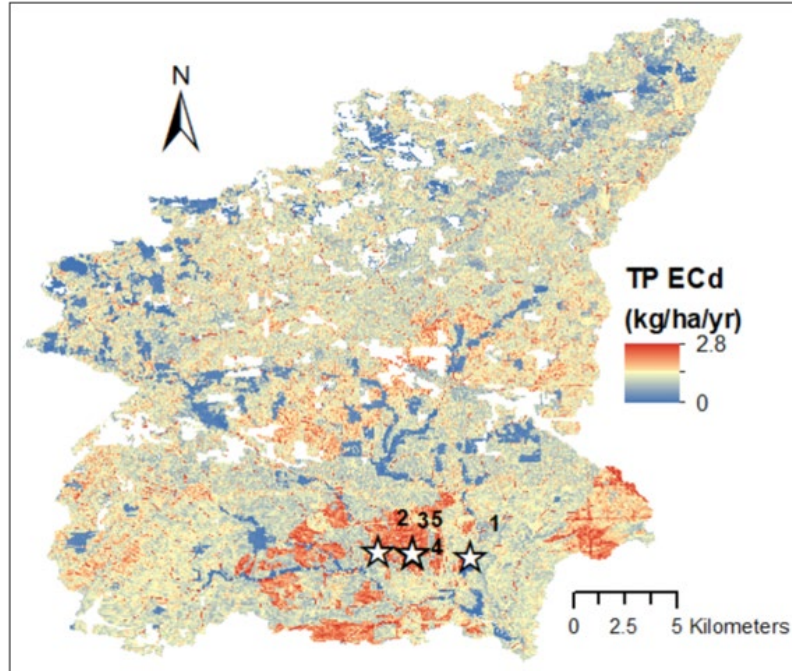
i-Tree Cool Air

A spatial air temperature model incorporating the impacts of trees and impervious cover



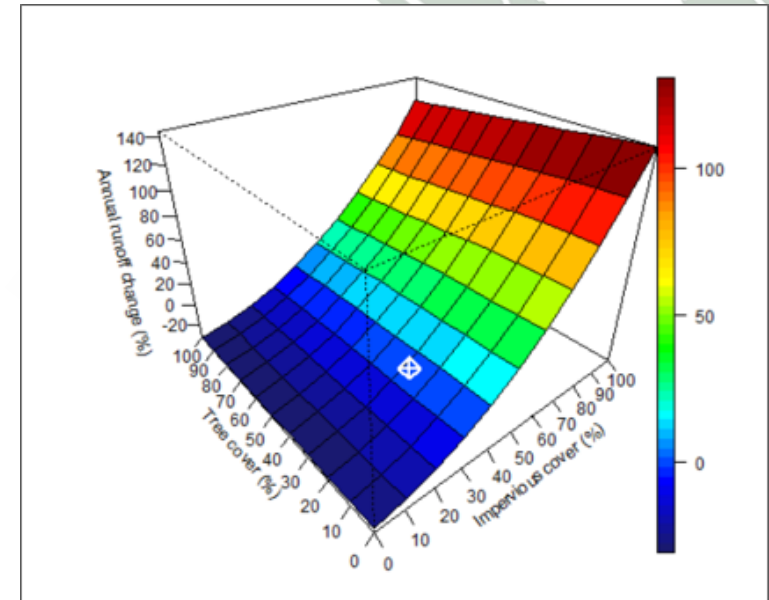
i-Tree Buffer

A spatially-distributed hydrological model that simulates effects of land use and topography to predict nutrient hot spots



i-Tree Hydro+

A hydrological model that simulates effects tree/impervious cover and green infrastructure on hourly runoff





i-Tree Cool Air: Example

Project heat mitigation by tree cover in Naples, Italy

EUROPEAN JOURNAL OF REMOTE SENSING
<https://doi.org/10.1080/22797254.2022.2125833>



OPEN ACCESS Check for updates

Integrating Copernicus land cover data into the i-Tree Cool Air model to evaluate and map urban heat mitigation by tree cover

Rocco Pace ^{a,b}, Francesca Chiocchini ^a, Maurizio Sarti ^a, Theodore A. Endreny ^c, Carlo Calfapietra ^a and Marco Ciolfi ^a

^aResearch Institute on Terrestrial Ecosystems (IRET), National Research Council (CNR), Porano, Italy; ^bInstitute of Meteorology and Climate Research, Atmospheric Environmental Research (IMK-IFU), Karlsruhe Institute of Technology (KIT), Garmisch-Partenkirchen, Germany; ^cDepartment of Environmental Resources Engineering, SUNY ESF, Syracuse, NY, USA

ABSTRACT

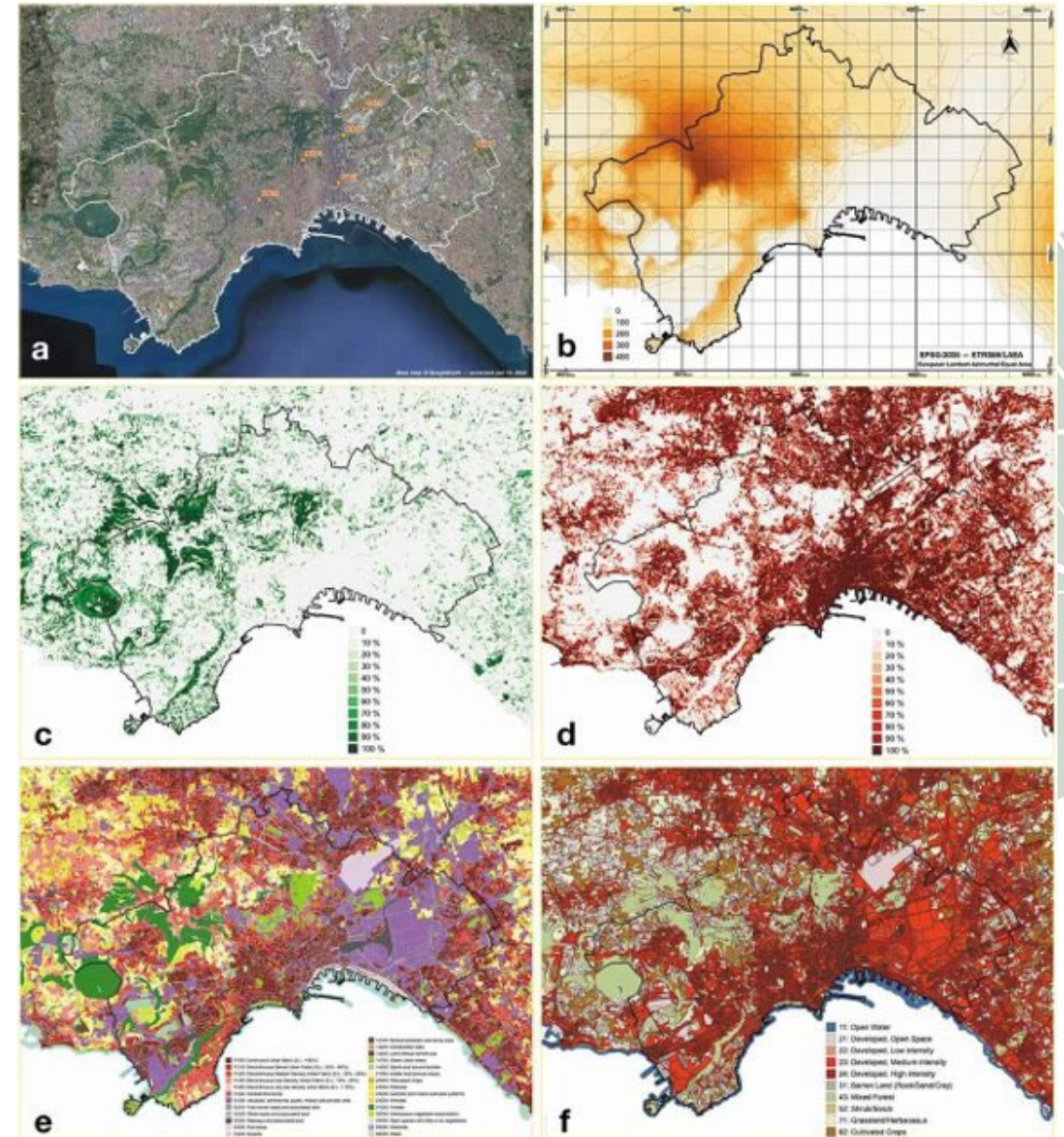
Cities host more than half of the world's population and due to global warming and land use change their vulnerability to deadly heat waves has increased. A healthy vegetated landscape can abate heat wave severity and diminish the related urban heat island through the process of evapotranspiration. This research aimed to develop a methodology for cities to use publicly available Copernicus land cover maps within the i-Tree Cool Air water and energy balance model to map air temperature and humidity. The manuscript presents proof of concept using Naples, Italy with its Mediterranean climate characterized by limited soil water for cooling via evapotranspiration. The approach achieved strong correlations between predicted and observed air temperatures across the city ($r \geq 0.89$). During the warm season of 2020, forested land cover was 5°C cooler than land cover dominated by impervious cover. Simulated land cover change, limited to a 10% increase or decrease in tree cover, generated an inverse change of 0.2°C in maximum hourly air temperature, with more trees obtaining cooler air. Soil water limited the cooling, with the generally wetter spring season enabling greater cooling of air temperatures, and summer droughts without irrigation had constrained cooling. Sustainable urban design will likely require an increase in plant cover along with a reduction of impervious surfaces that absorb and reradiate heat in order to improve community resilience to heat waves.

ARTICLE HISTORY

Received 18 March 2022
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KEYWORDS

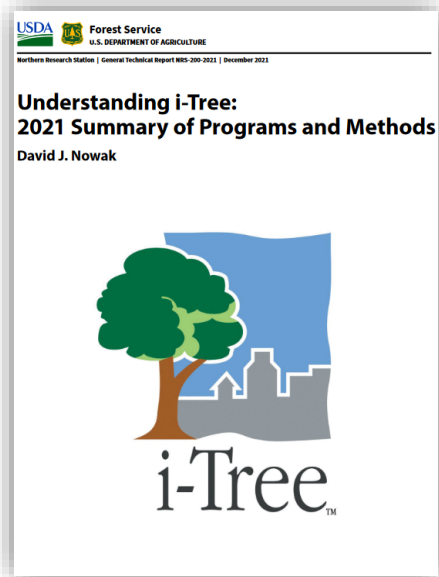
Heat waves; urban trees; temperature reduction; mediterranean city; Urban Atlas; ecosystem services





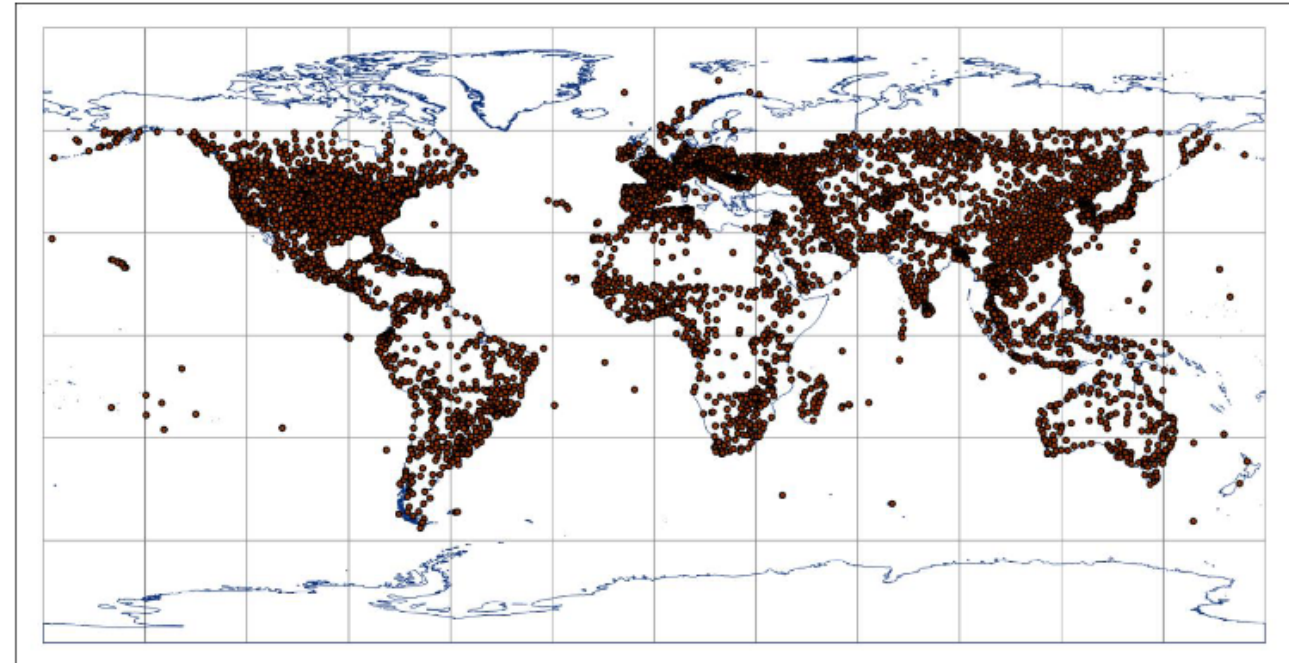
More recent science updates

- Understanding i-Tree omnibus methods documentation
- Tropical species carbon equations
- Leaf nutrients estimates
- Urban wood values
- Species specific pollen production



In development

- Expanded weather data
- Wildlife model enhancement
- New tree cover and climate projections
- i-Tree Energy
- ...and more

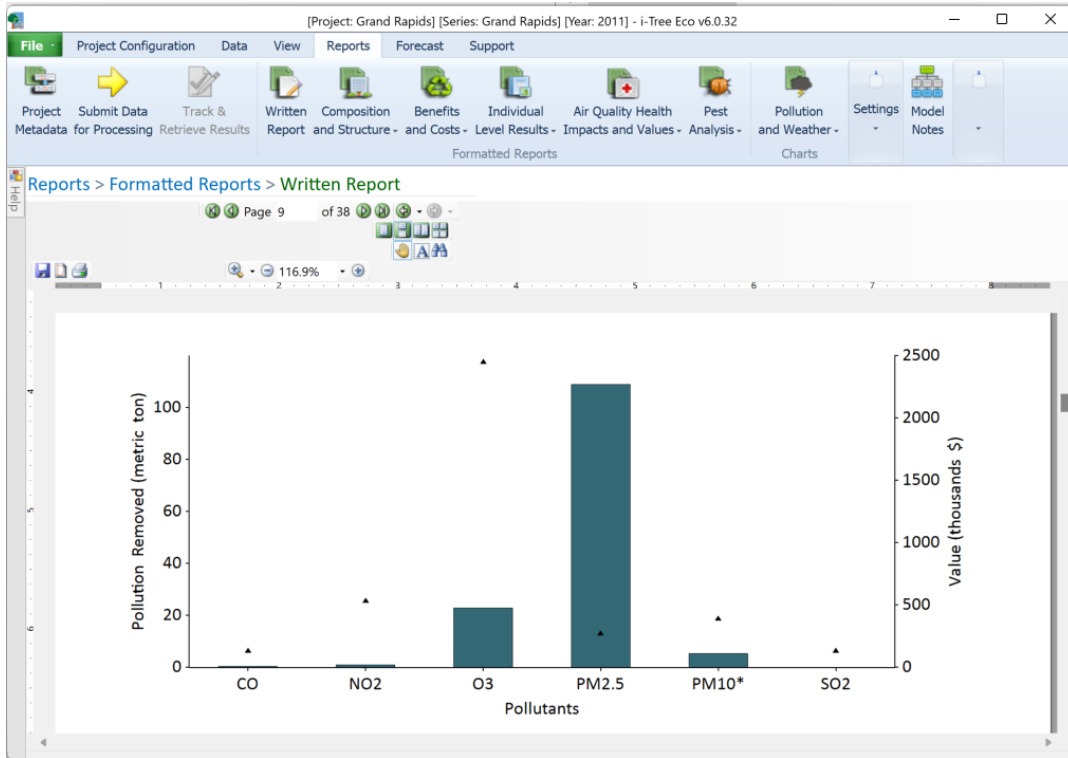




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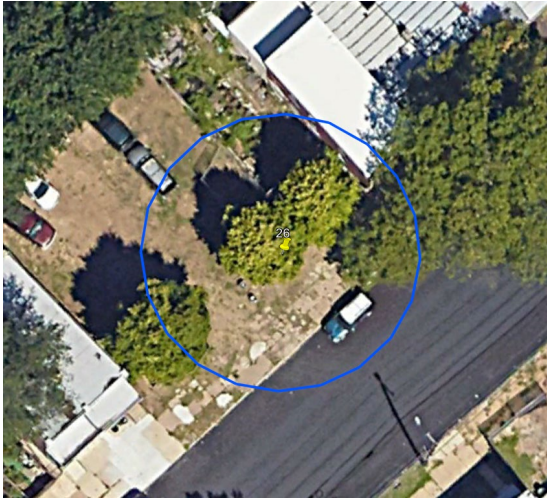
Washington DC, 2023

i-Tree is more than science





i-Tree Eco our flagship tool: Easy data import



	A	B	C	D	E	F
1	Zone	Species	Scientific Name	DBH	CONDITION	
2	NE	Hackberry	Celtis occidentalis	22	Poor	
3	NE	MapleNorway	Acer platinoides	15	Good	
4	NW	Honeylocust	Gleditsia triacanthos	24	Good	
5	NW	Crabapplepp	Malus	4	Good	
6	SE	Redbud, Eastern	cercis canadensis	3	Poor	
7	SE	Pinespp.	Pinus	15	Poor	
8	SE	LindenOrnamental	Tilia cordata	18	Good	
9	SE	Maackia	Amur maackii	4	Dead	
10	SE	MapleNorway	Acer platinoides	6	Poor	
11	SE	Redbud, Eastern	cercis canadensis	3	Poor	
12	SE	Honeylocust	Gleditsia triacanthos	17	Fair	
13	NW	Hawthorn spp.	crataegus	2	Good	
14	SE	Crabapplepp	Malus	6	Dying	
15	SE	Redbud, Eastern	cercis canadensis	3	Fair	
16	NW	AshGreen	Fraxinus Pennsylvanica	19	Good	
17	NE	AshGreen	Fraxinus Pennsylvanica	18	Good	
18	NW	MapleSugar	Acer saccharum	28	Dying	
19	NW	MapleNorway	Acer platinoides	9	Good	
20	NW	MapleSilver	Acer saccharinum	35	Excellent	
21	SE	Ulmus americana 'princeton'	Ulmus americana 'princeton'	7	Good	
22	SE	MapleSilver	Acer saccharinum	38	Good	
23	NW	Crabapplepp	Malus	7	Dying	
24	NE	MapleNorway	Acer platinoides	19	Good	
25	SW	Crabapplepp	Malus	8	Good	
26	SE	LindenOrnamental	Tilia cordata	15	Good	
27	NE	Ginkgo	Ginkgo biloba	2	Fair	
28	SE	Honeylocust	Gleditsia triacanthos	5	Poor	
29	SE	MapleNorway	Acer platinoides	17	Fair	
30	NE	Hackberry	Celtis occidentalis	2	Fair	



Data > Inventory Data > Plots

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2	4/27/2012	Ingrowth	19.20		338 Black cherry (Prunus serotina)	Vacant
3	4/27/2012	Ingrowth	34.60		352 American elm (Ulmus americana)	Vacant
4	4/27/2012	Ingrowth	10.00		0 American elm (Ulmus americana)	Vacant
5	4/27/2012	Ingrowth	17.70		10 Black cherry (Prunus serotina)	Vacant
6	4/27/2012	Ingrowth	35.20		20 Silver maple (Acer saccharinum)	Vacant

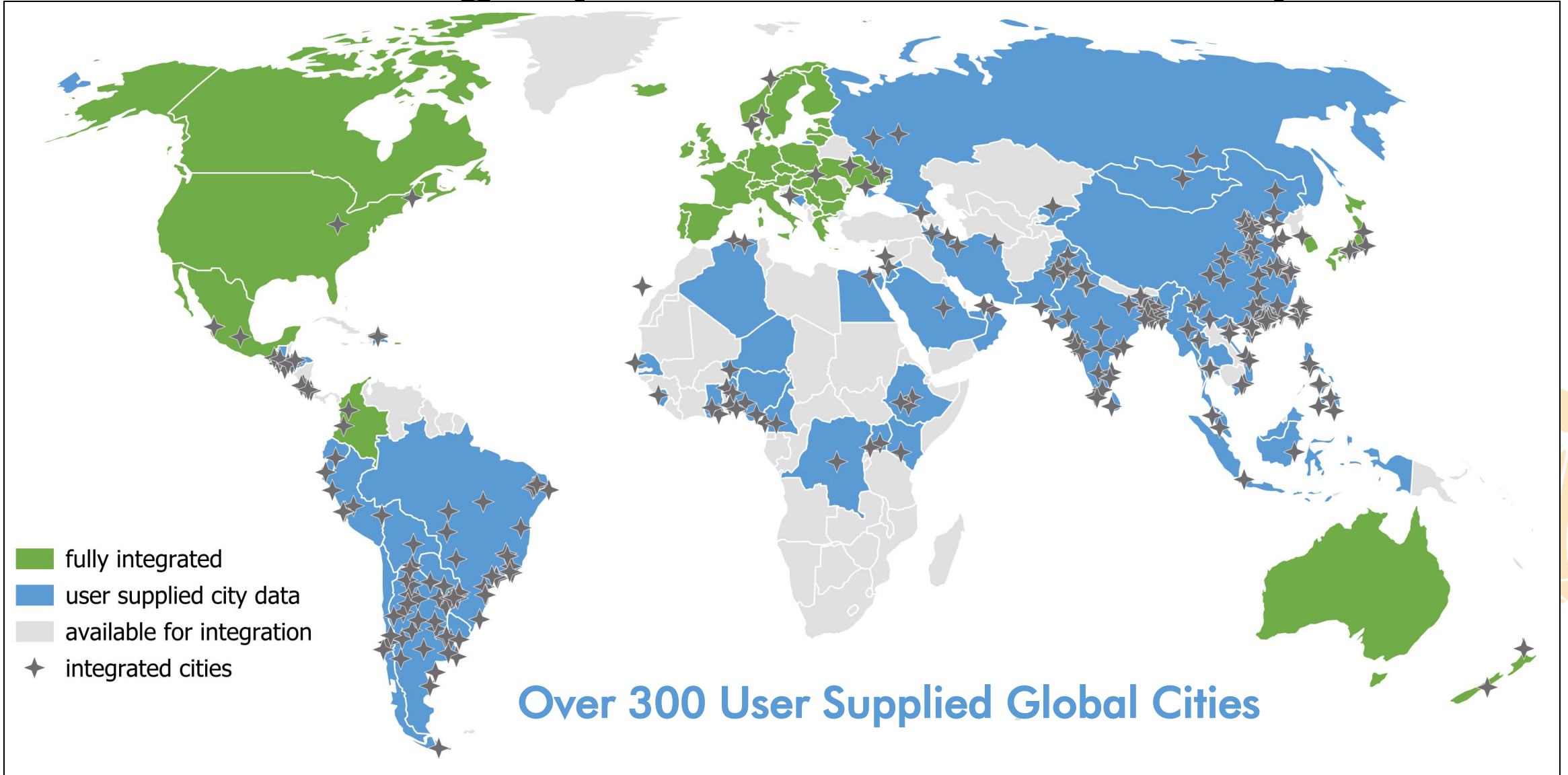


Up to 500,000 trees





i-Tree Eco our flagship tool: Available in more places

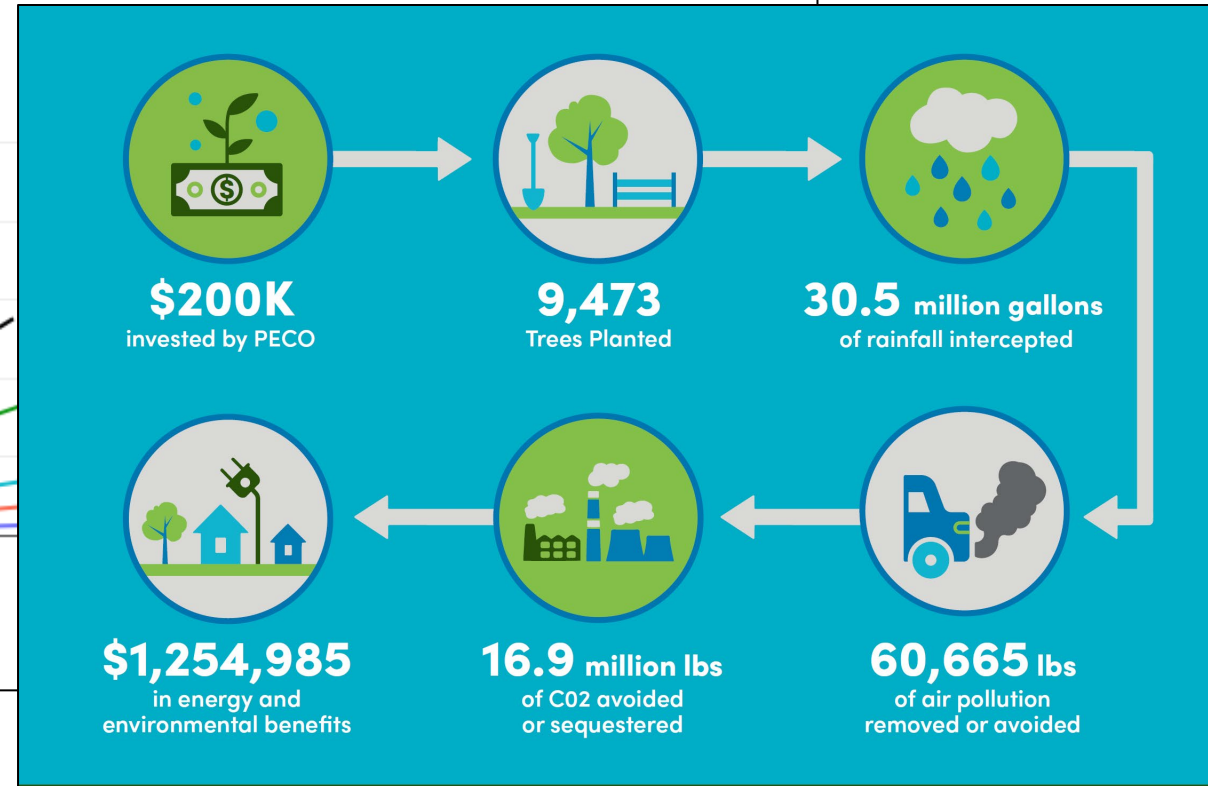
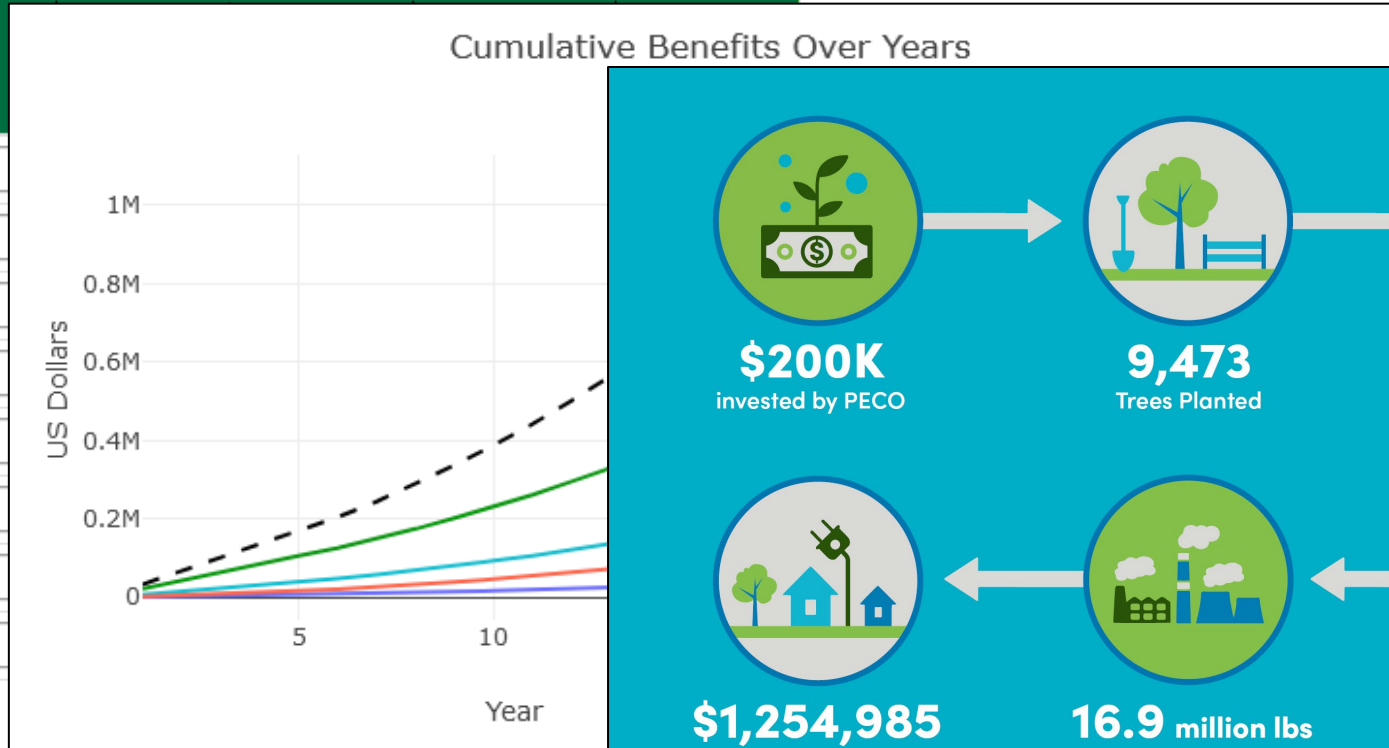




i-Tree Planting: Project benefits of 1,000's of trees

Tree Group Information		Tree Details
------------------------	--	--------------

+	Group Number	Species
×	1	Acer campestre
×	2	Acer x freemanii
×	3	Acer tataricum ssp. ginnala
×	4	Acer saccharum
×	5	Acer miyabei
×	6	Acer nigrum
×	7	Acer rubrum
×	8	Acer saccharum



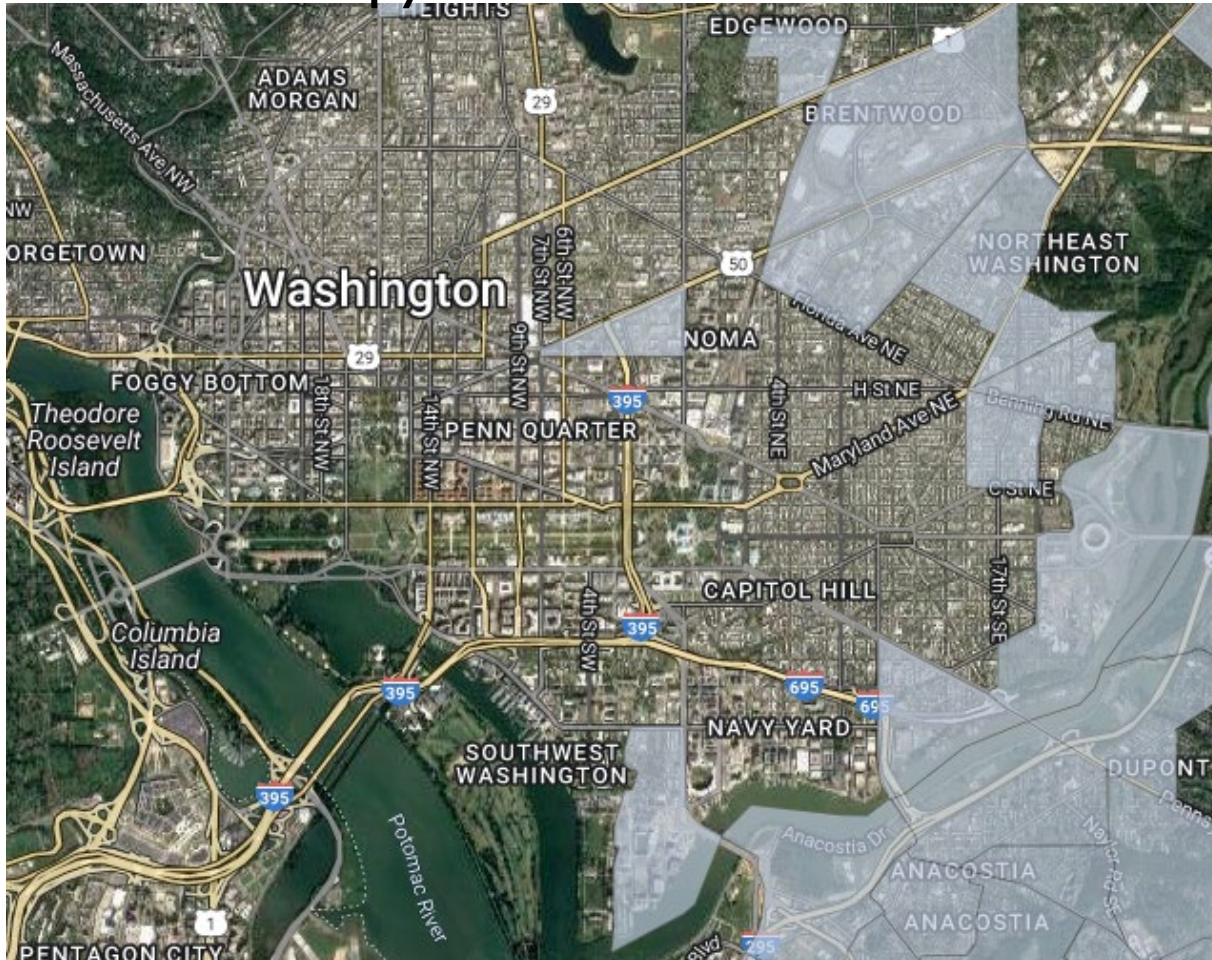
2022 Tree Planting

Projected 20 year cumulative values
Source: US Forest Service Northern Research Station & iTree

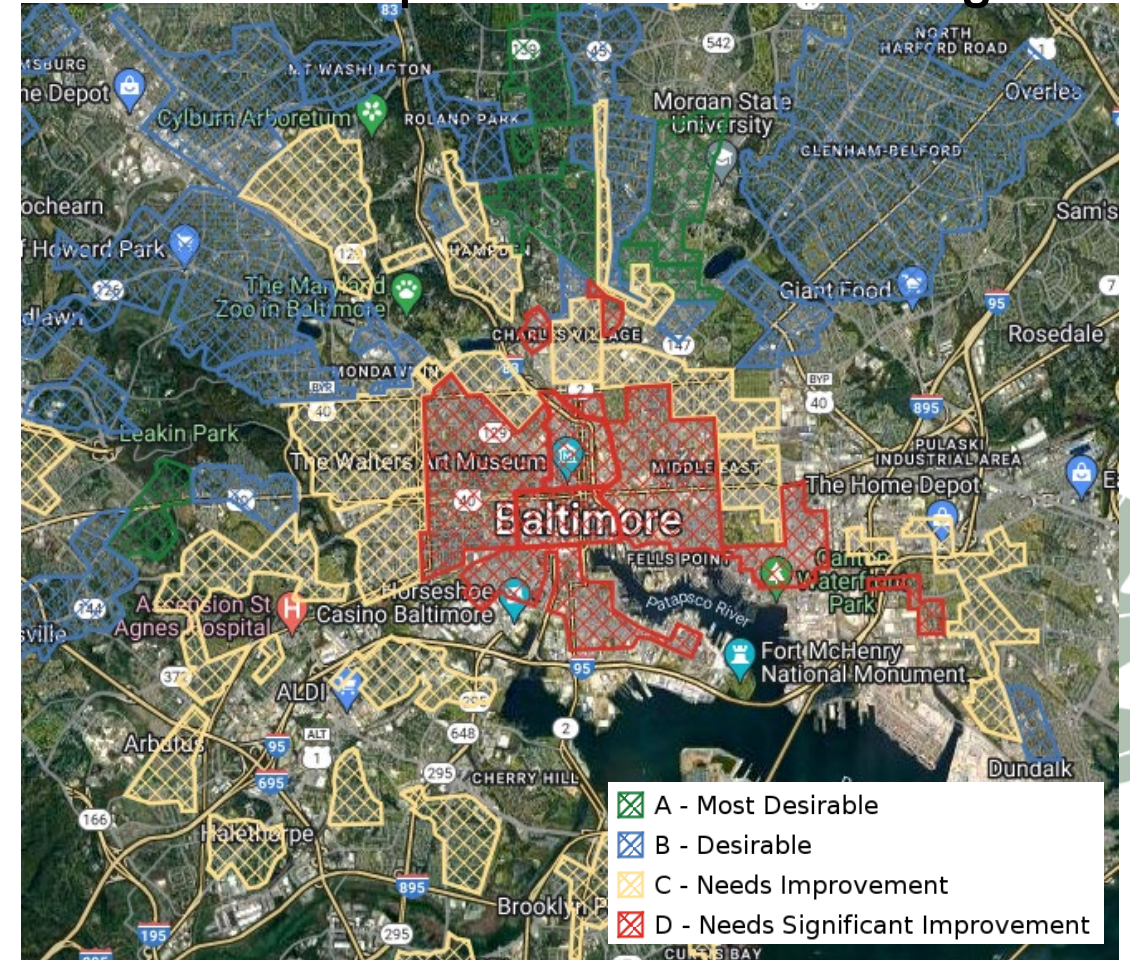


Easier to identify where tree benefits matter

i-Tree Canopy—Climate & Economic Justice



i-Tree Landscape—Historic Red-lining Data

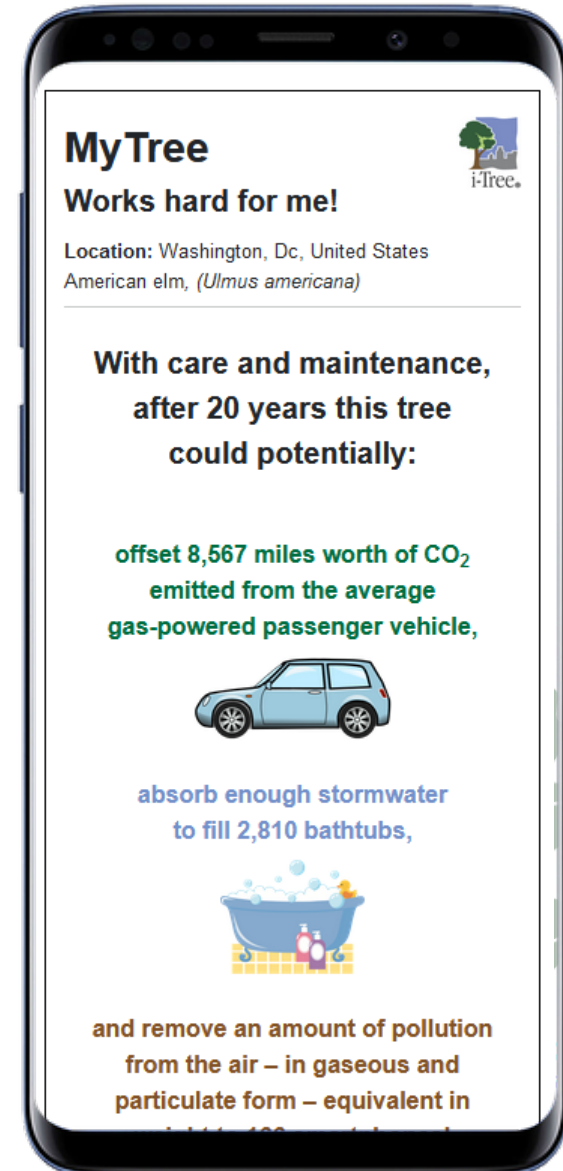
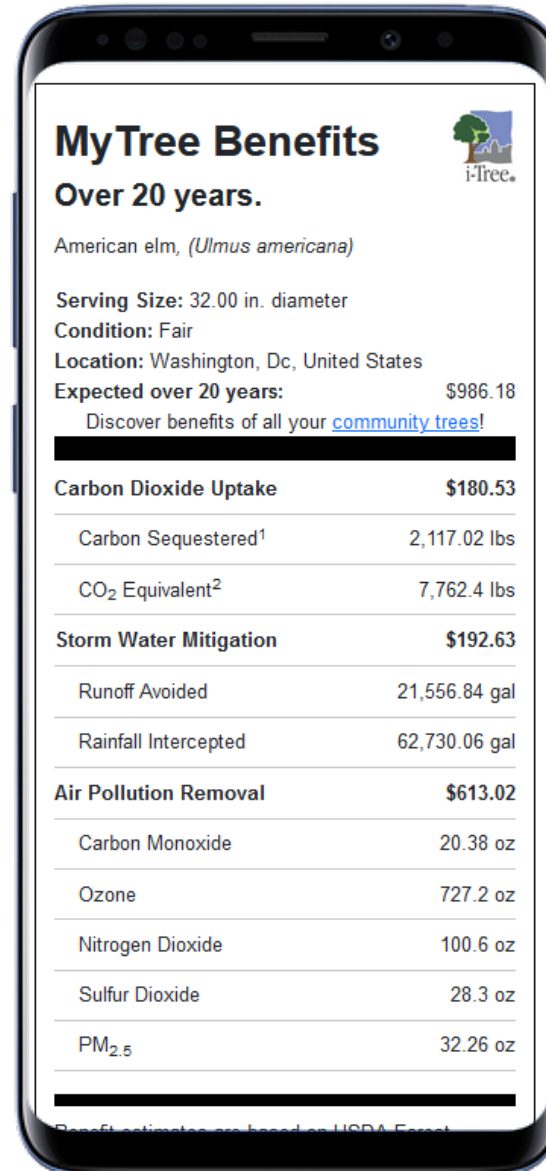
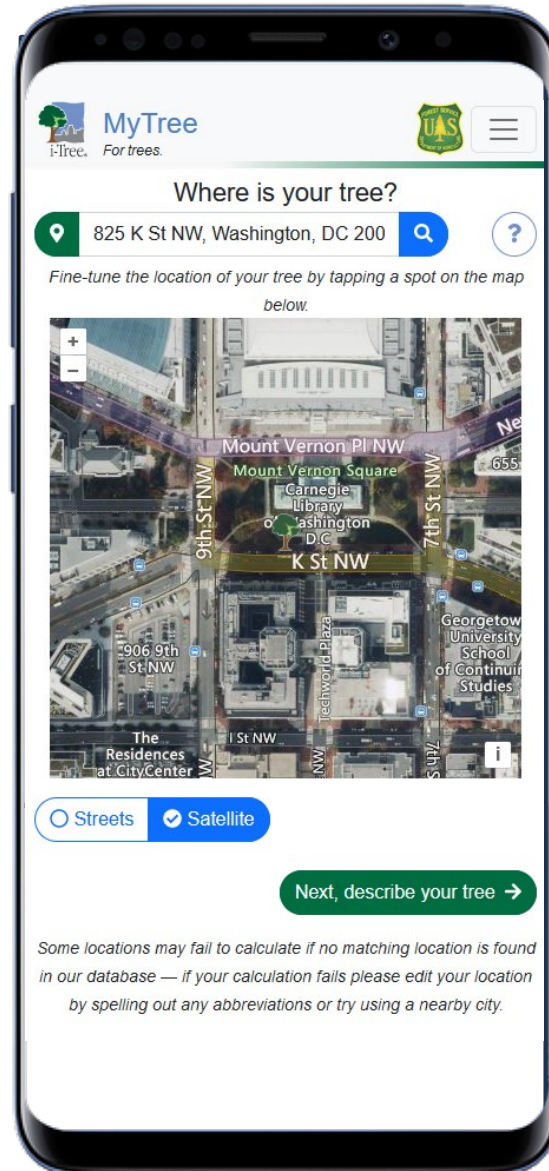




MyTree: i-Tree Science Everywhere



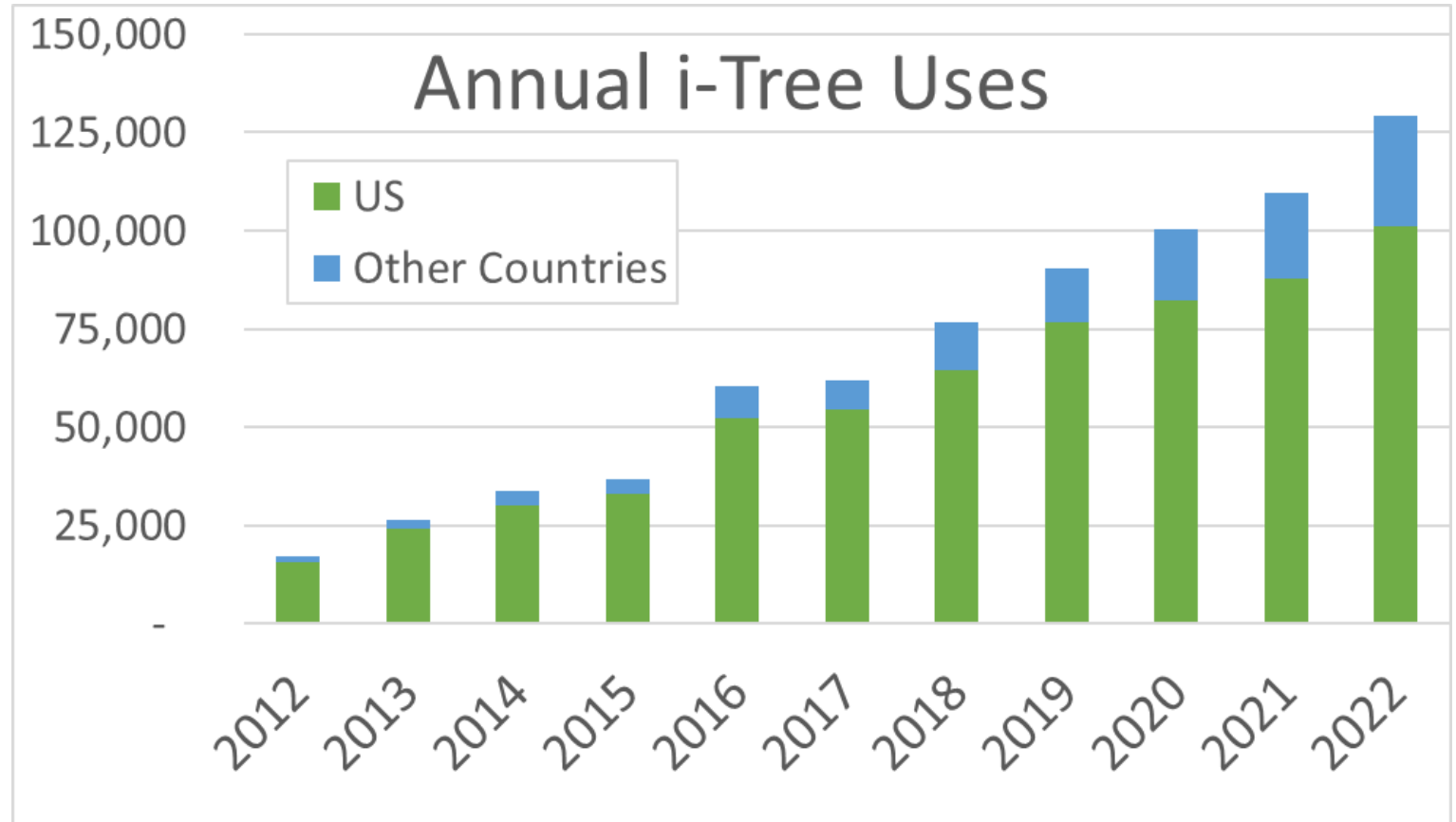
MyTree.itreetools.org





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- i-Tree For Funding webinars
- i-Tree International Academy
- i-Tree Office Hours
- Over 1,000 individual technical support contacts each year





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www.itreetools.org

Connect with us

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- Future i-Tree Academies
- Office Hours
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- info@itreetools.org





Thank you

Jason Henning | The Davey Institute

www.itreetools.org

 Jason.Henning@davey.com



Food and Agriculture
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United Nations



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Foundation



International Society of Arboriculture



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2023



**World Forum on
Urban Forests**



2nd World Forum on Urban Forests

Washington DC, 2023

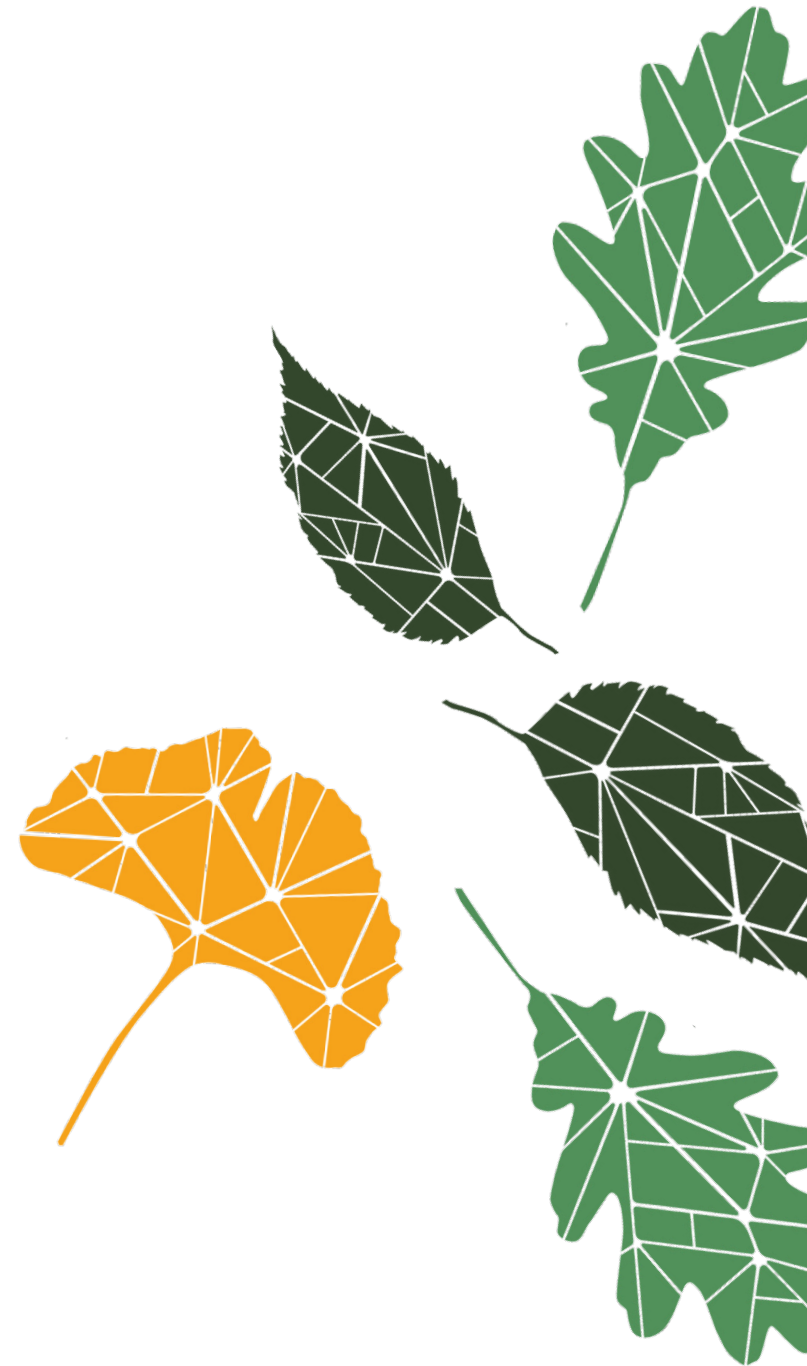
Transdisciplinary and arts-centered
approaches to stewardship and
sustainability of urban forests



Presented by

Lindsay K. Campbell, PhD

Co-authors: Chris Fremantle, David Maddox,
Erika Svendsen, Sarah Hines, Mary Mattingly,
Matthew López-Jensen, Nikki Lindt, Liza
Paqueo, Michelle Johnson





Context

- Climate change, unsustainable development, and systemic inequality produce 'wicked problems' that require multidimensional thinking and practice.
- Arts offers a distinct 'way of knowing' and a novel approach to these problems.
- Transdisciplinarity addresses complex challenges and values different forms of knowledge.





Approach: Urban Field Station Collaborative Arts Program

- We build understanding of and engagement with urban forests and social-ecological systems through arts.
- We facilitate transdisciplinary collaboration between artists, scientists, and land managers.
- We curate events and public programs that explore ideas emerging from these collaborations.



(www.ufsarts.com)





Materials and Methods

- UFS Arts programmatic data from 2016-2023, including:
 - Organizing team field notes
 - Group debriefs from quarterly UFS Arts all hands meetings
 - Artists' program evaluation assessments
- Case studies:
 - Matthew López-Jensen's *Tree Love*
 - Nikki Lindt's *Underground Sound Project*
 - Mary Mattingly's *Swale*
 - The UFS exhibition *Who Takes Care of New York?*





**2nd World Forum on
Urban Forests**

Washington DC, 2023

Sensitizing us to the capacities of trees and forests



(Left to Right: *Tree Love* by Matthew López-Jensen;
Underground Sound Project by Nikki Lindt)





**2nd World Forum on
Urban Forests**

Washington DC, 2023

Critical provocation, social practice art, and productive landscapes



(Swale by Mary Mattingly)

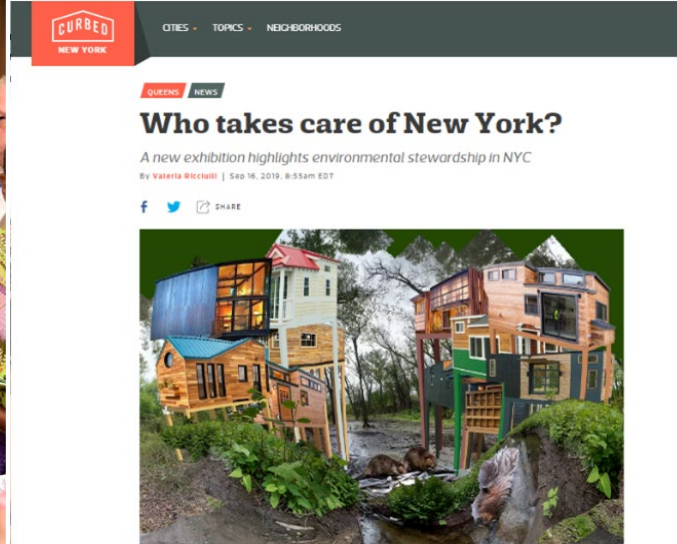




Amplifying stories of community stewardship



(Who Takes Care of New York? Photos courtesy of Malcolm Pinckney, NYC Parks)





Discussion

How do collaborations between artists, scientists, and land managers transform stewardship practices?

- 1.** By posing new types of questions, art can create an opening for critical reflection in land management.
- 2.** Art can engage multiple ways of knowing and making meaning of place, land, and ecosystems; these modes have the potential to engage a wide range of diverse publics.
- 3.** Art can recognize and engage in two-way learning and dialogue across differences.





2nd World Forum on Urban Forests

Washington DC, 2023

Join us!

- Urban Field Station Collaborative Arts Program welcomes new artists and collaborative partners – contact us.
- Current 2024 call for artists is open at: www.ufsarts.com.



Kilia Llano, Santo Domingo, DR



Michele Brody, New York



Ania Upstill, New York



Tommy Cheemou Yang, New York



Krystal Mack, Baltimore, MD



Nalu Andrade, Honolulu, HI



Franklin Cruz, Denver, CO



Aaron Terry, Philadelphia, PA



Amir Campbell, Philadelphia, PA



Richard Johnson, Springfield, MA



Hector Resto, Guaynabo, Puerto Rico



Samih Abu Zakieh, Hebron, Palestine



The 2022 UFS artist cohort





Thank you

Lindsay Campbell | USDA Forest Service

www.ufsarts.com

 Lindsay.campbell@usda.gov



Food and Agriculture
Organization of the
United Nations



Arbor Day
Foundation



International Society of Arboriculture



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2023



**World Forum on
Urban Forests**



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Washington DC, 2023



Urban Forests and Equity:

The Use of the My City's Trees App to Explore the Distribution of Trees and Benefits in Several U.S. Cities Through a Social Vulnerability Lens



Presented by

Tonya Lister, USDA Forest Service, Forest Inventory and Analysis (FIA)

Sjana Schanning, USDA Forest Service, FIA

Nancy Sonti, USDA Forest Service, Baltimore Field Station

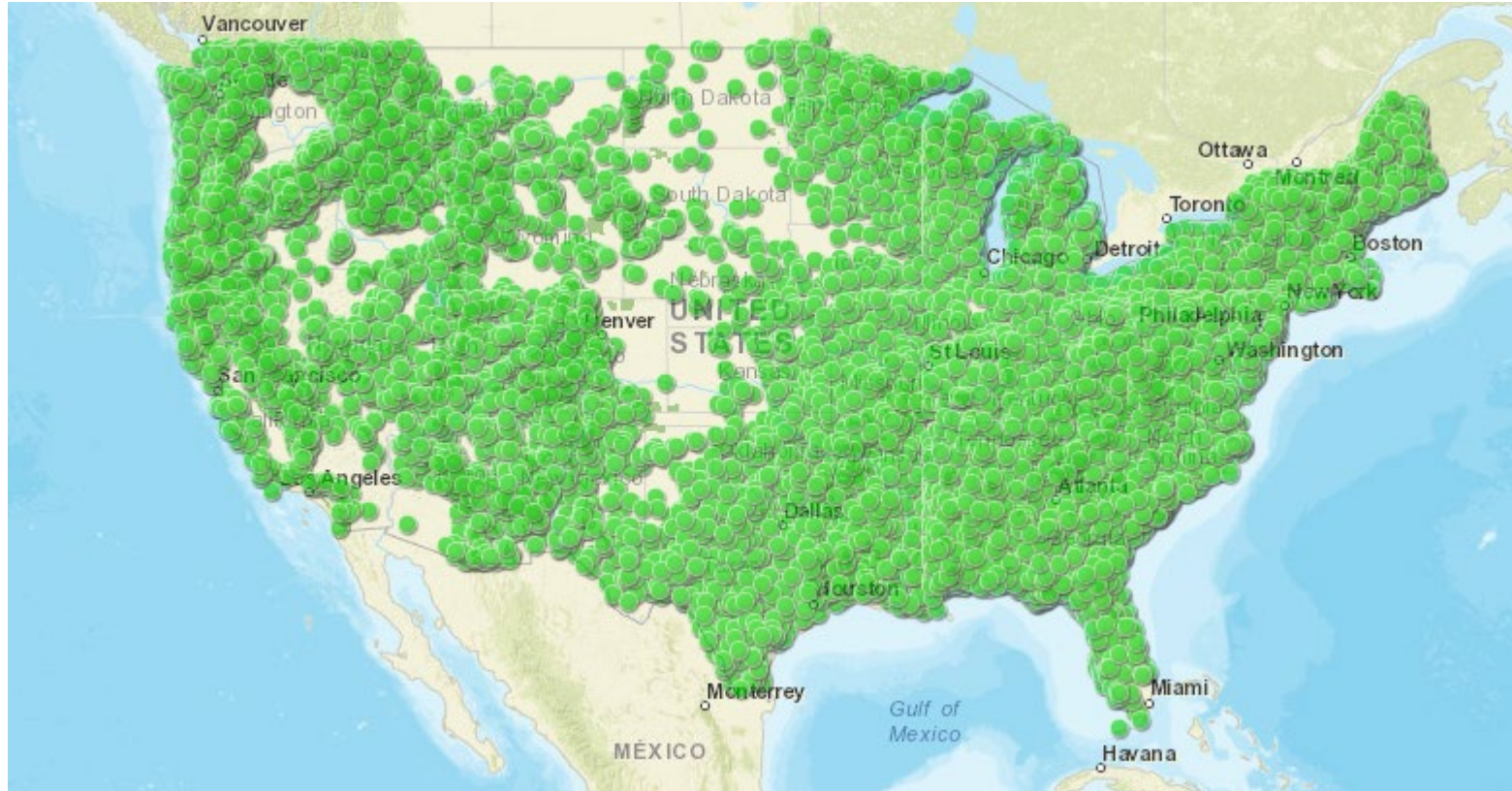
Rebekah Zehnder, Texas A&M Forest Service



U.S. Department of Agriculture
Forest Service



USDA Forest Service, Forest Inventory and Analysis (FIA) Program



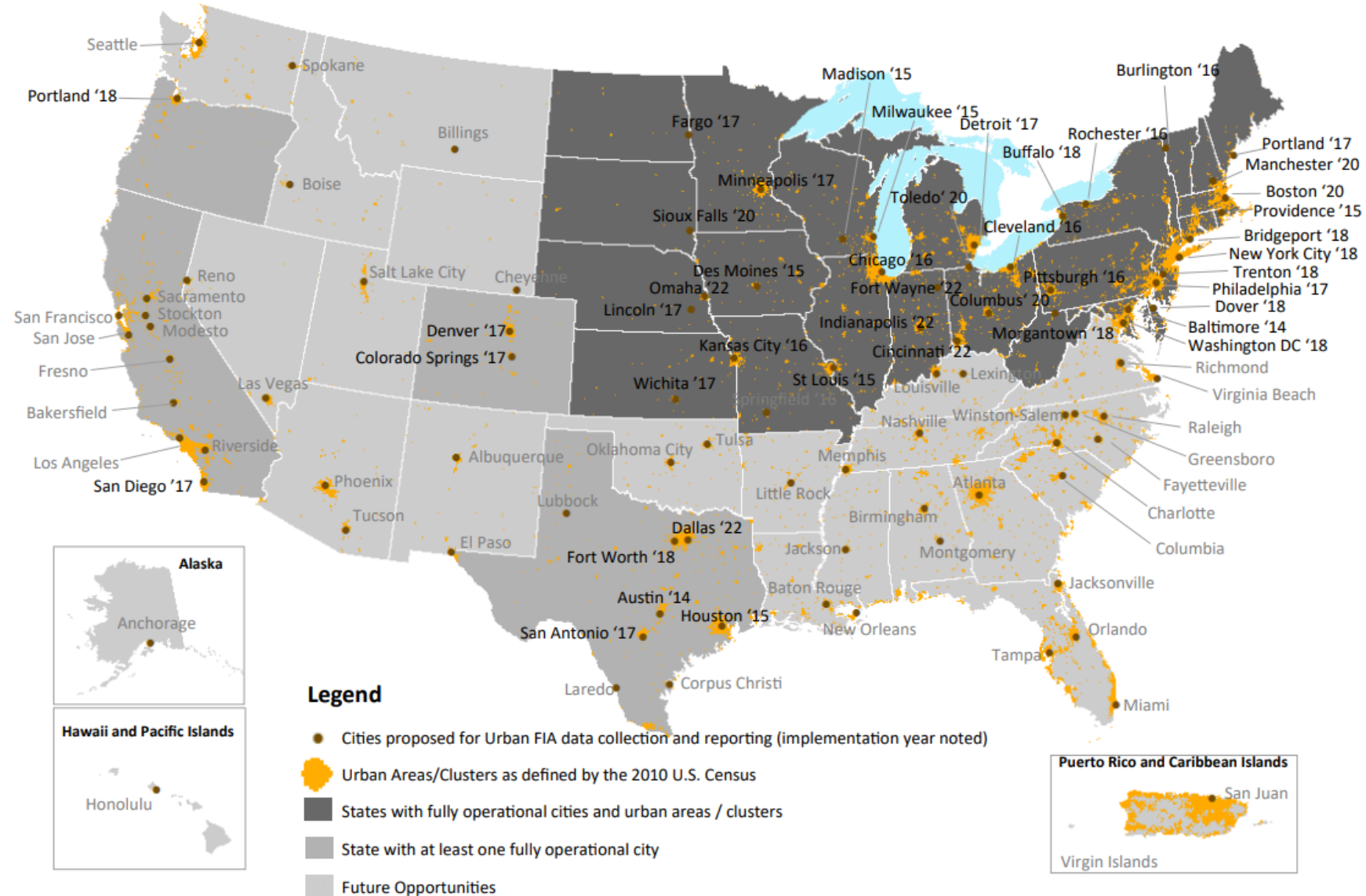
FIA field crews sample more than 130,000 forested plots (represented by dots) to compile the inventory. These plots are found throughout the continental United States, Alaska, and the Nation's territories in the Caribbean and Pacific.





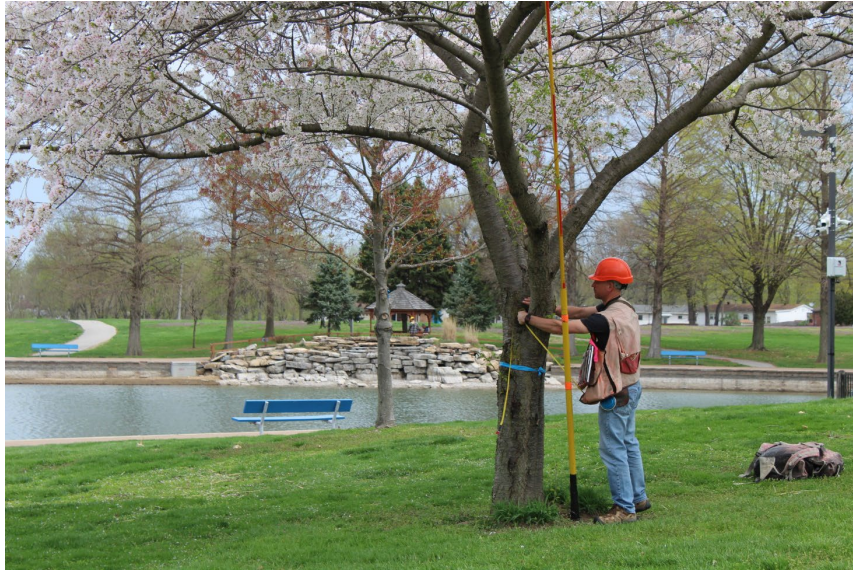
Urban FIA Program Goal

- Annually monitor the forests of all U.S. Census-defined urban areas with a special emphasis on the largest cities in the nation.
- UFIA is currently initiated in 44 cities, in 28 states with 24 statewide urban area projects.





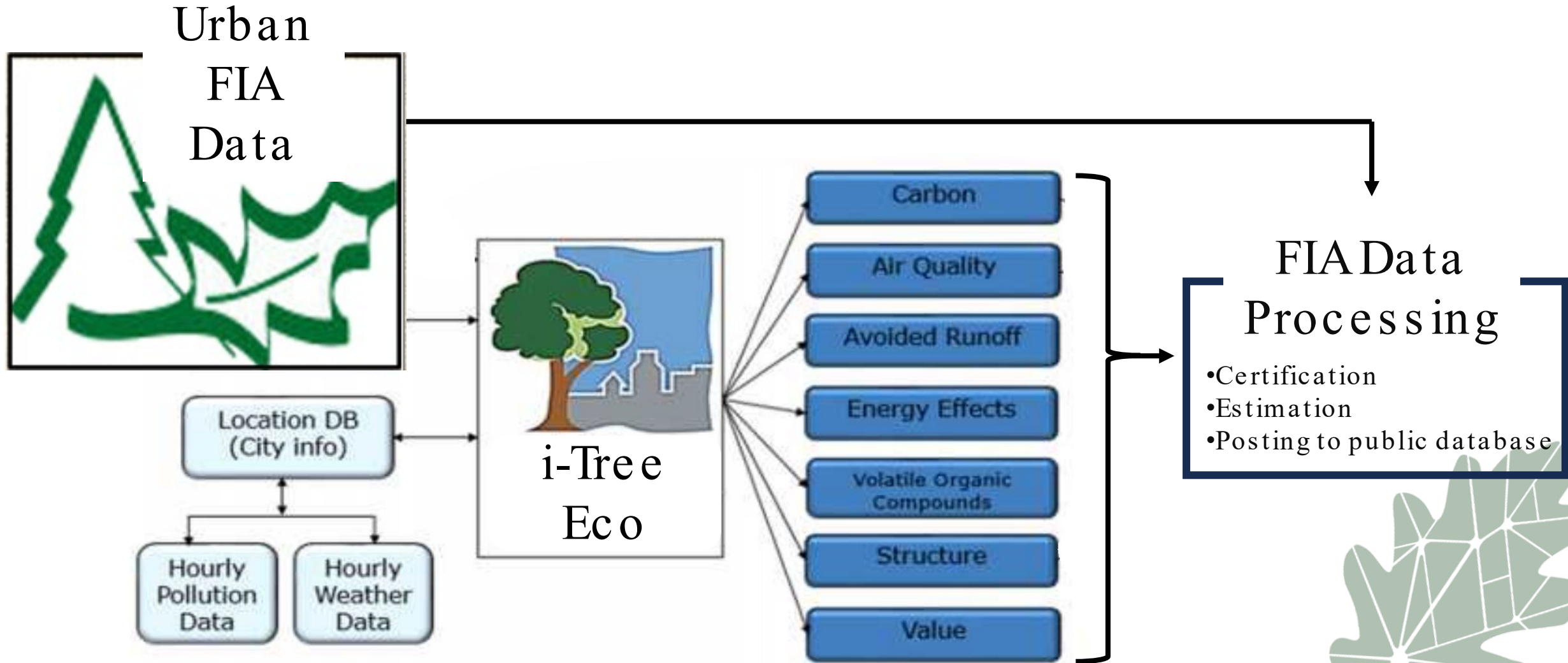
Urban FIA Data-FIA core variables



- Tree data--species type, tree measurements, damages, health, and condition...
- Site conditions –land use, ownership, veg and surface cover
- Percent cover of selected invasive plant species...
- Derived estimates of volume, biomass, and carbon
- Change data and trend estimates with remeasurement data



Integration of i-Tree Eco Methods





MY CITY'S TREES

Bringing the Nation's Forest Census to Urban Areas




[Learn More](#)









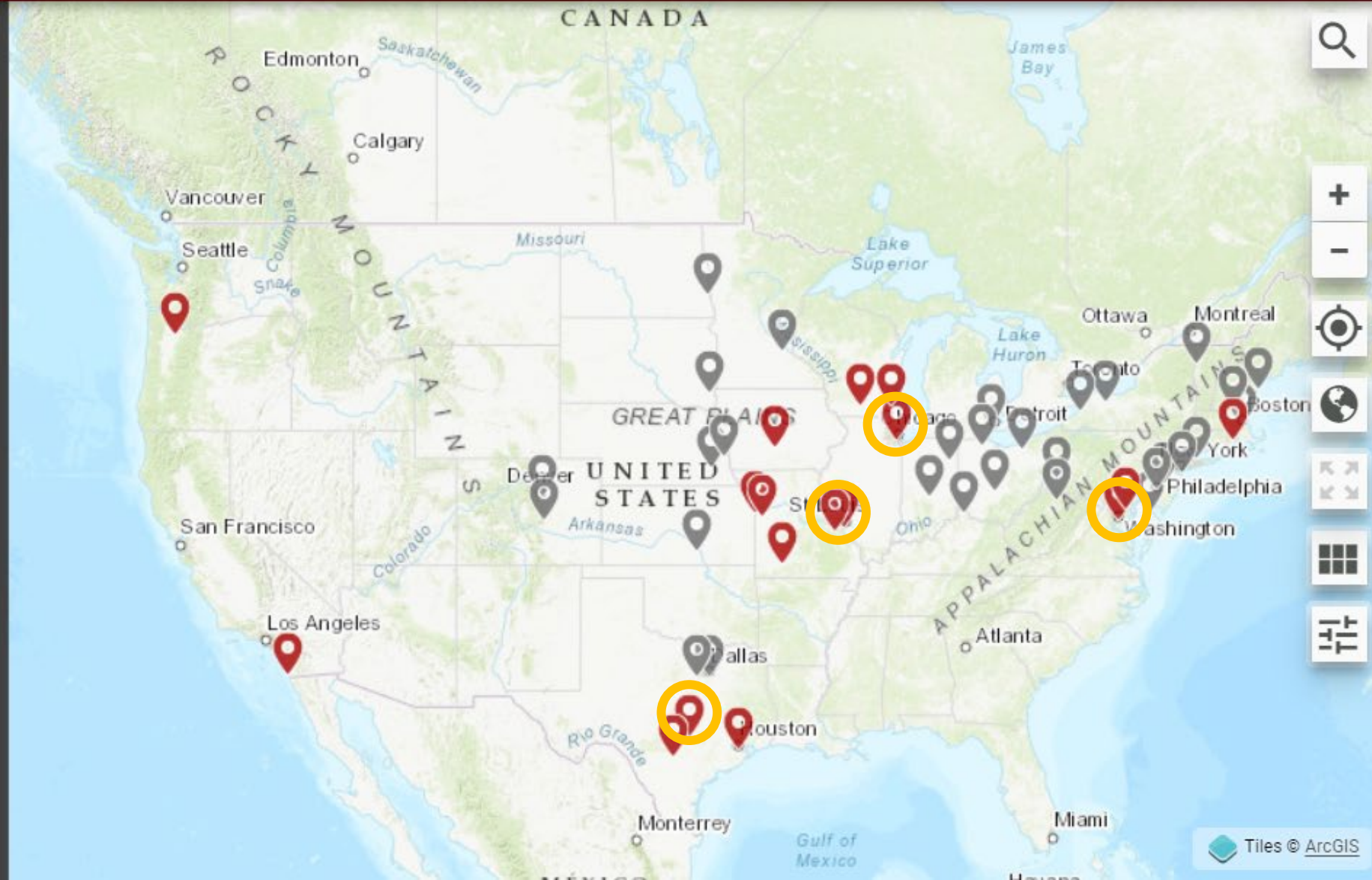
[OPEN APPLICATION](#)

[CONTACT US](#)



 No selection  No selection  No selection

MY CITY No city selected	MY AREA No city selected
 SELECT CITY  ▾	
 SELECT THEME  ▾	
 SELECT CLASSES  ▾	





Washington, DC Social Vulnerability 6/6

St. Louis, MO

Greater St. Louis, MO

Washington, DC

SELECT THEME

Land Cover

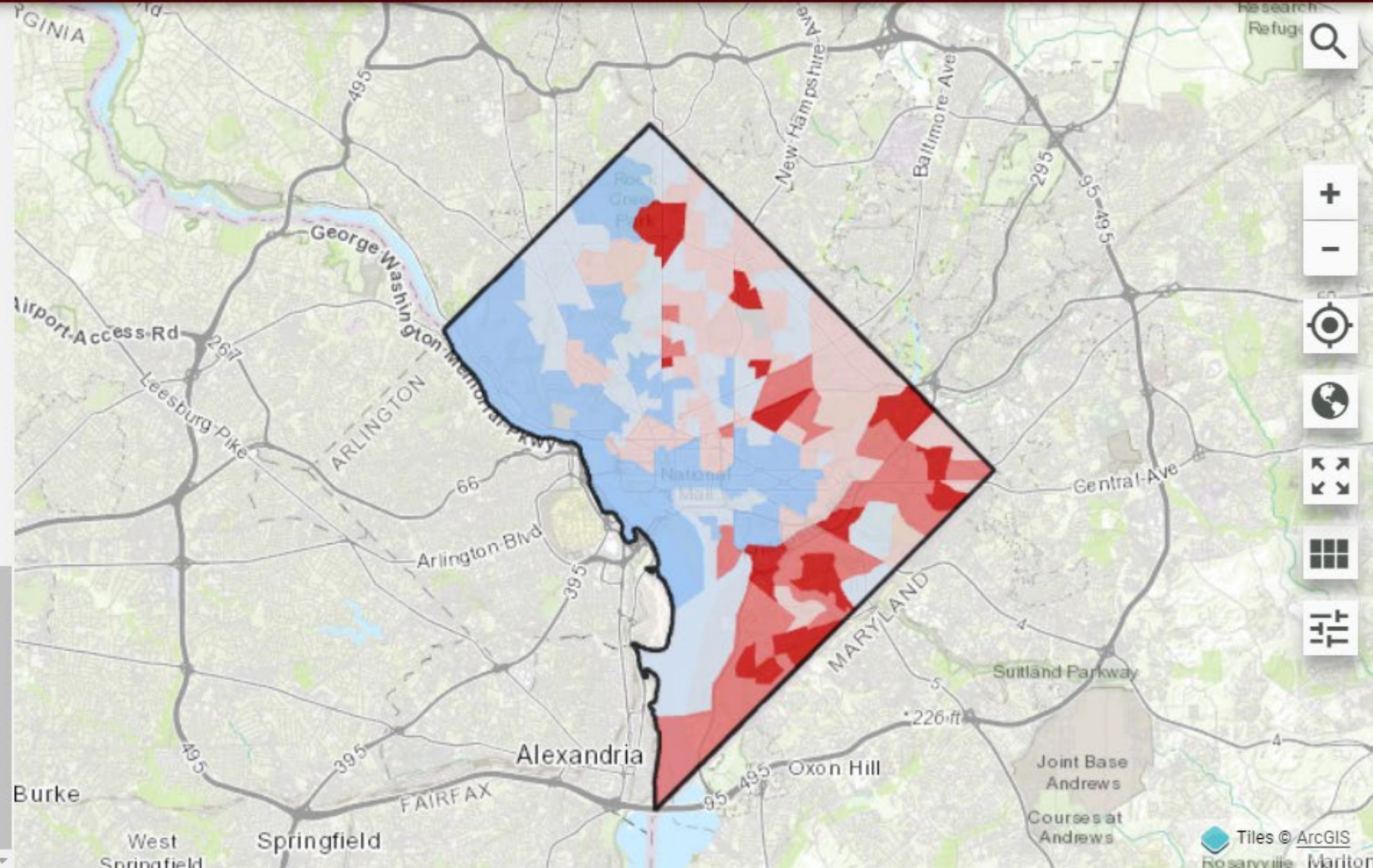
Population Density

Social Vulnerability

Heat Sensitivity-Exposure

Wards

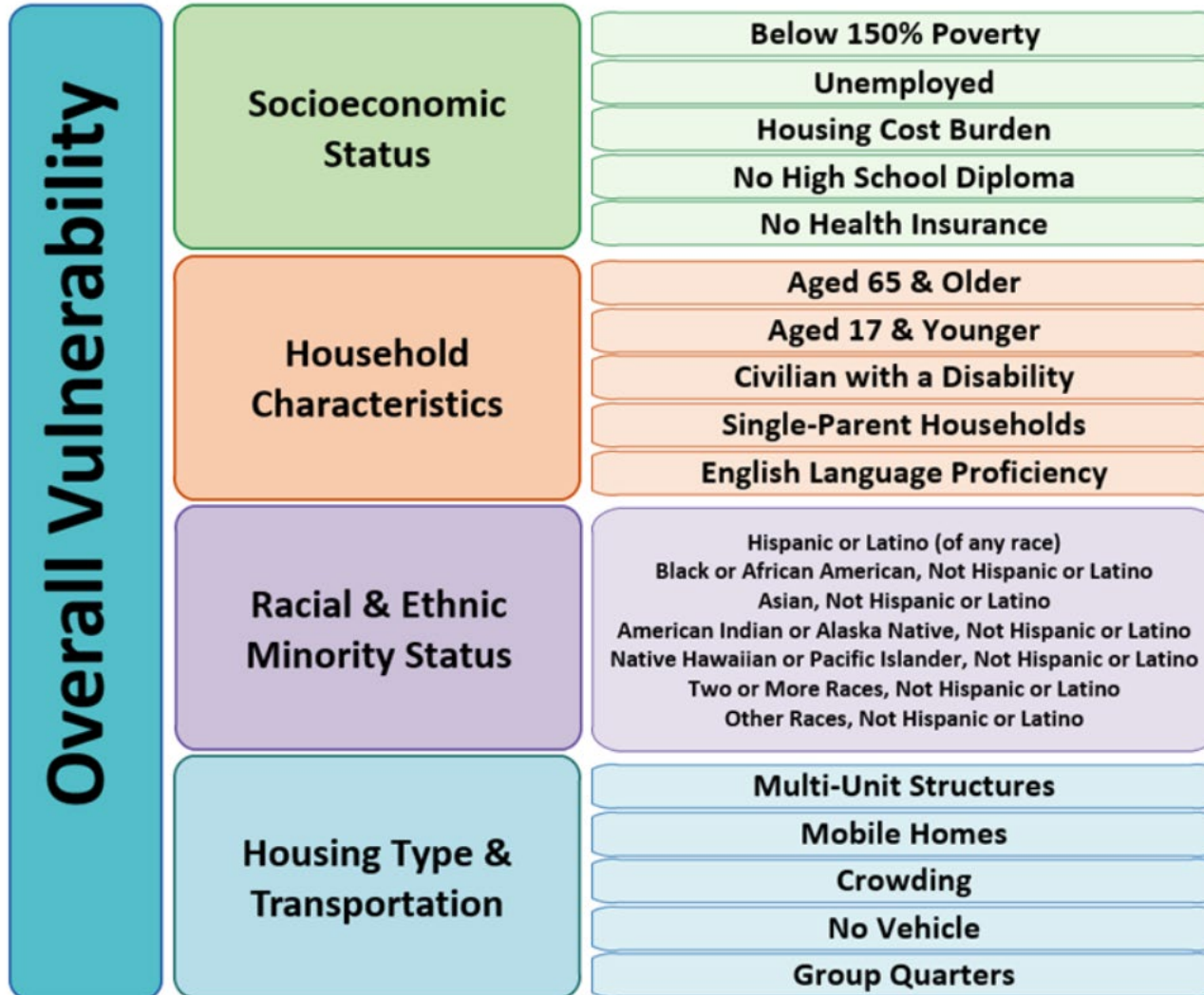
SELECT CLASSES



Social Vulnerability Index (SVI)

Centers for Disease Control and Prevention (CDC)

Agency for Toxic Substances and Disease Registry (ATSDR)



- Developed to help public health officials and emergency response planners identify and map the communities that will most likely need support before, during, and after a hazardous event.
- Relative ranking of vulnerability based on 16 social factors from 2020 U.S. Census American Community Survey data.



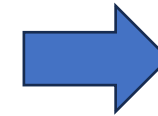
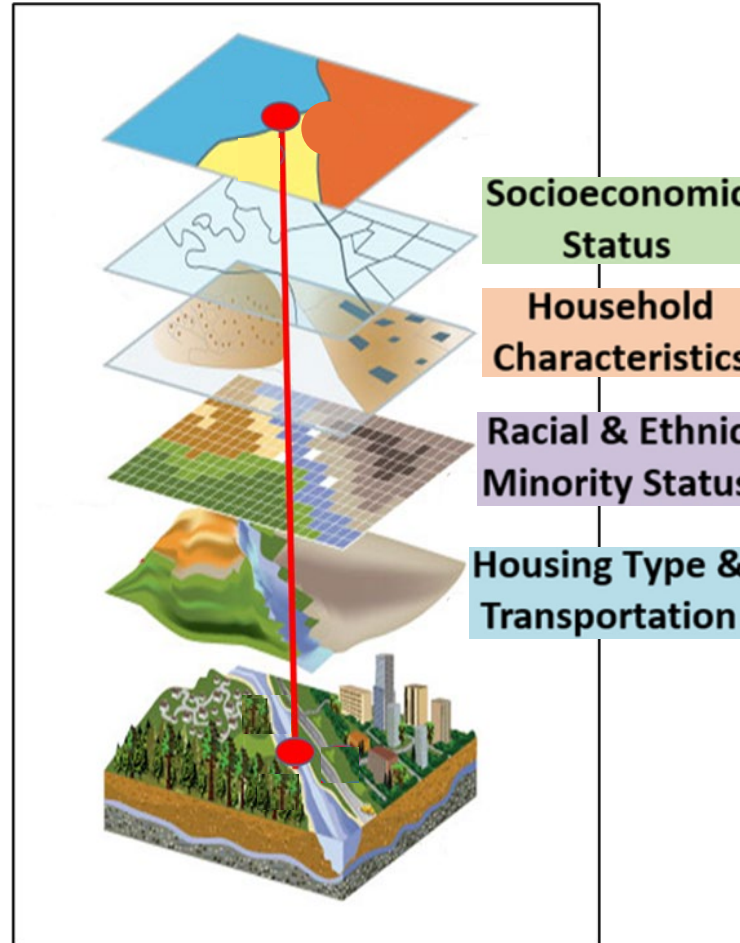
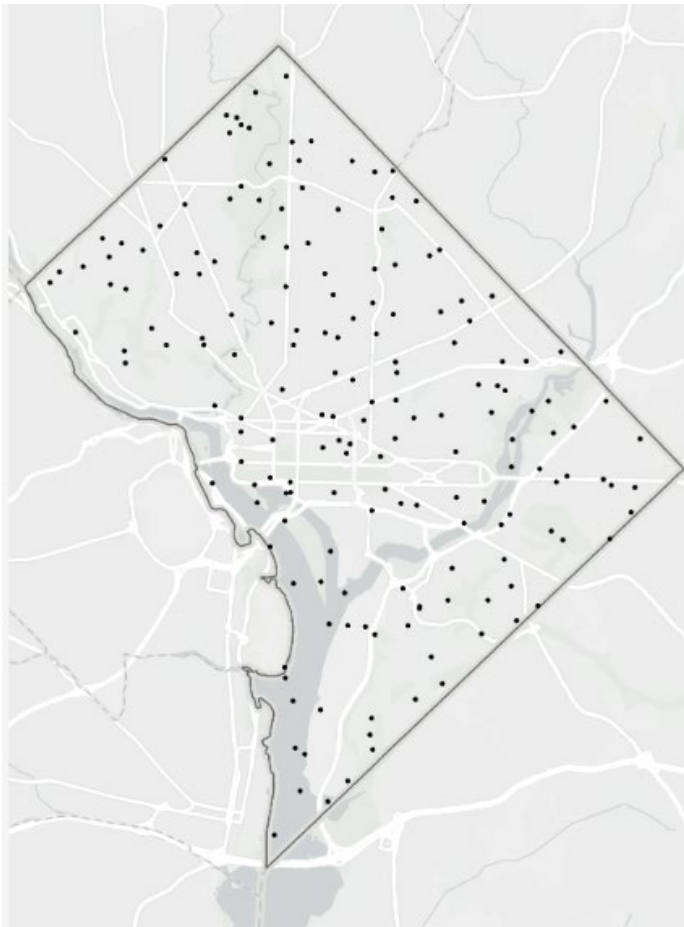


Attaching SVI Data to Urban FIA Plots

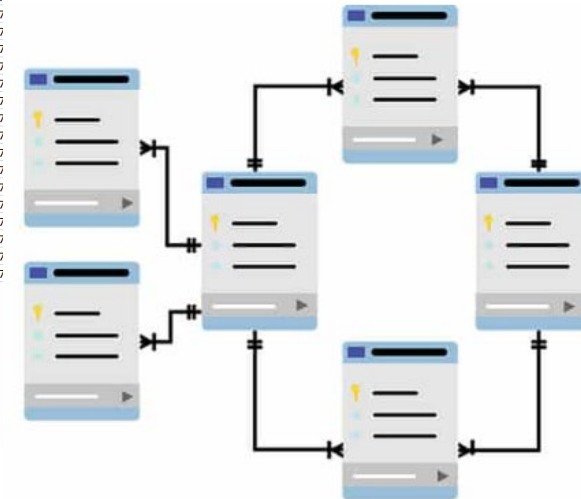
Urban FIA plots in Washington, DC

Plots are labeled with census tract SVI data

SVI available as an analysis variable

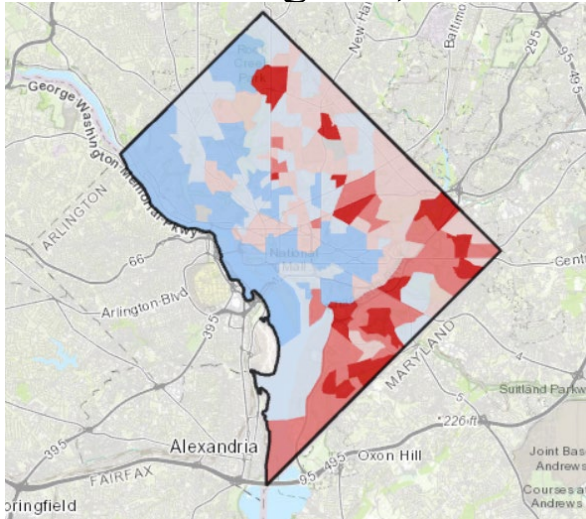


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1.27309E+15	Washington2021Curr	508333377126144	0.19	0.19	0.19	0.19
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1.27309E+15	Washington2021Curr	508333382126144	0.06	0.06	0.06	0.06
1.27309E+15	Washington2021Curr	508333383126144	0.01	0.01	0.01	0.01
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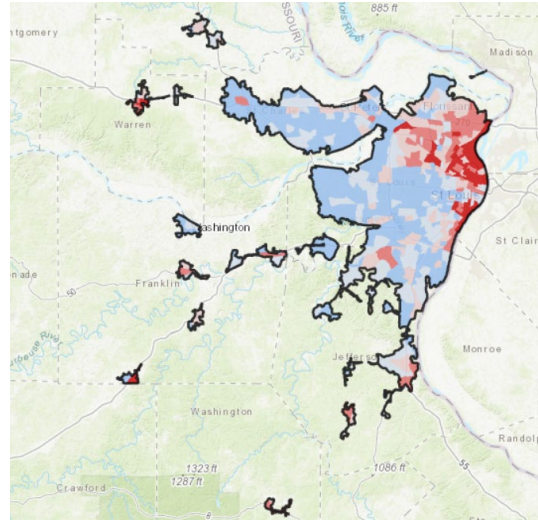


Tree Density by Social Vulnerability

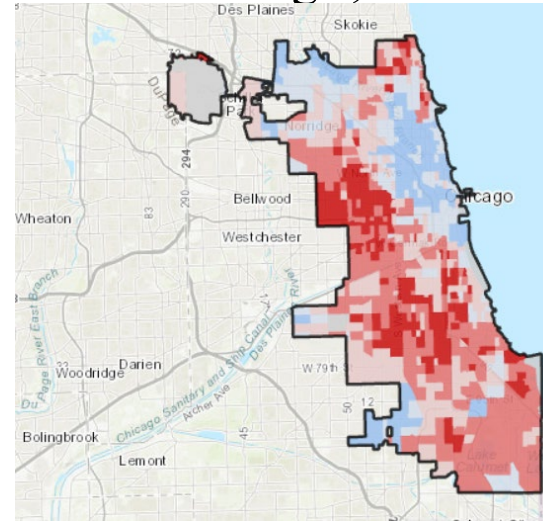
Washington, DC



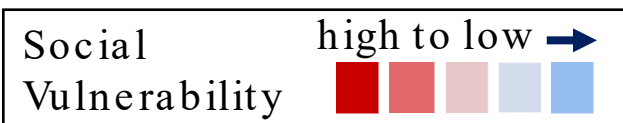
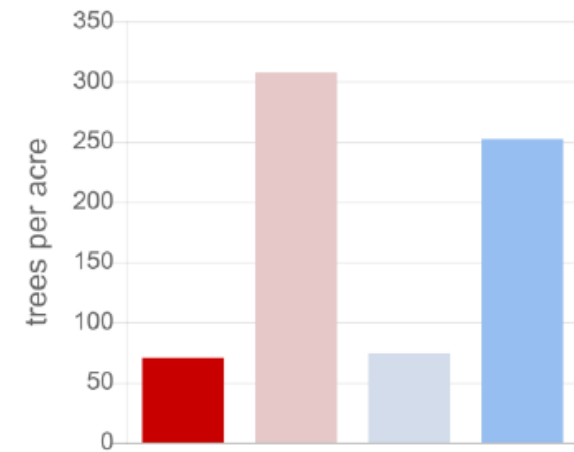
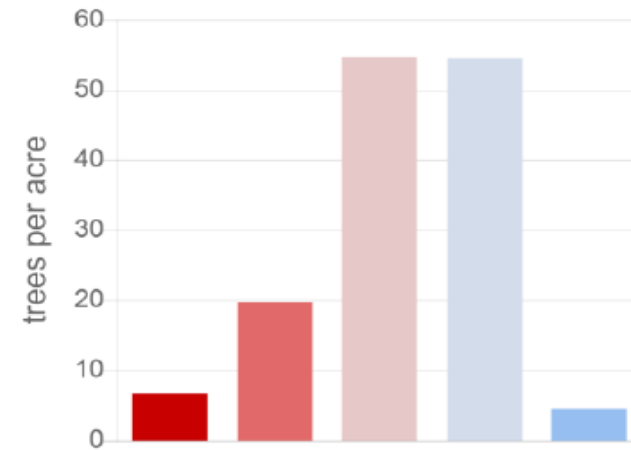
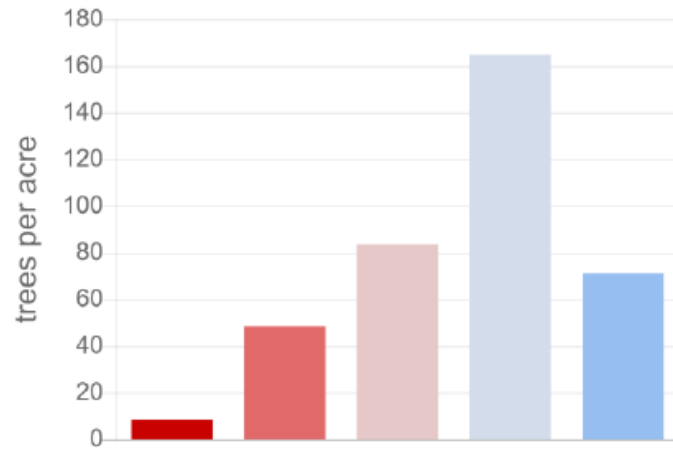
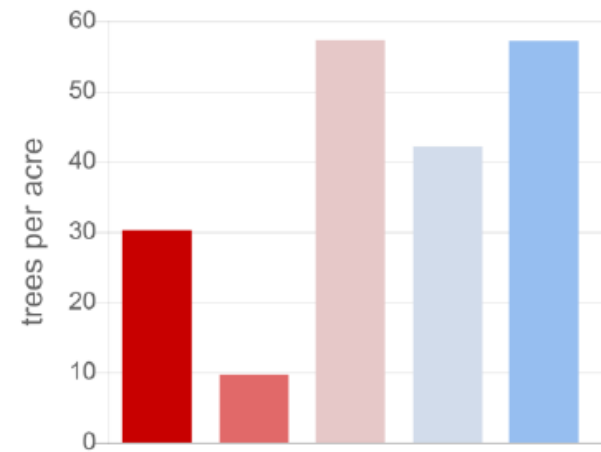
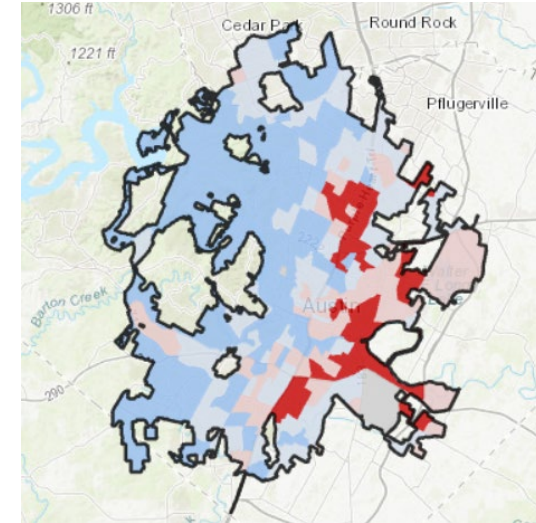
Greater St. Louis, MO



Chicago, IL



Austin, TX



Select Ecosystem Services by Social Vulnerability

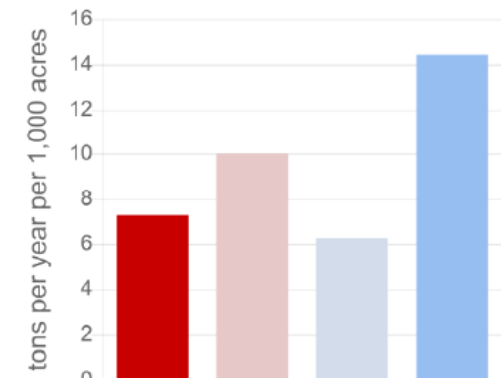
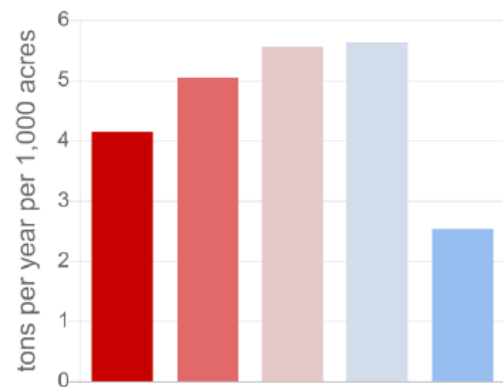
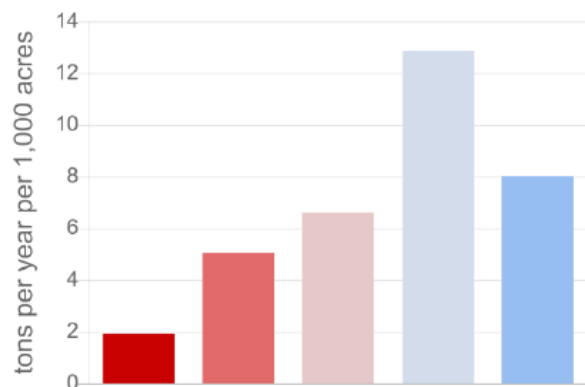
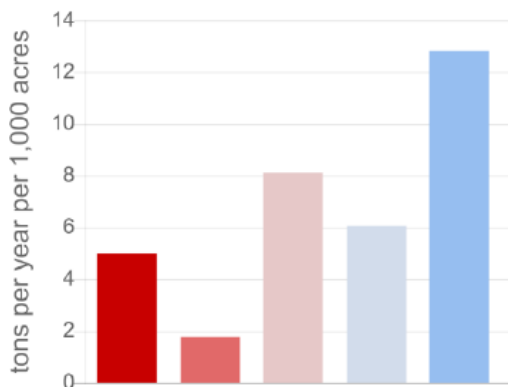
Washington, DC

Greater St. Louis, MO

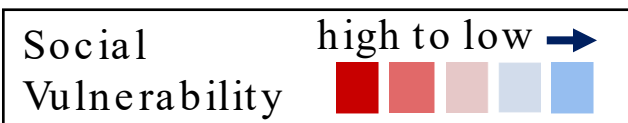
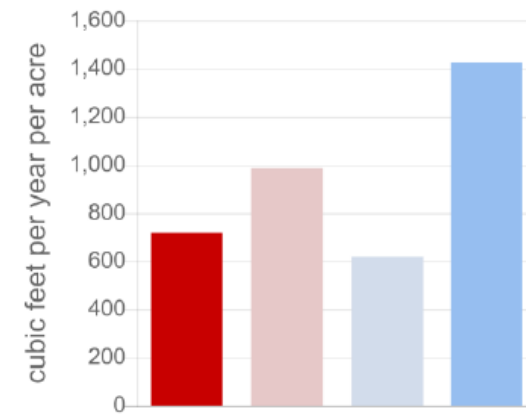
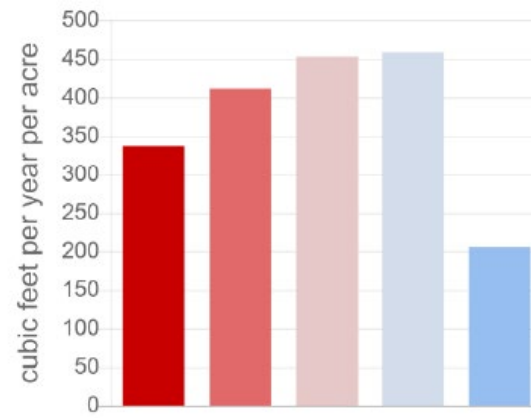
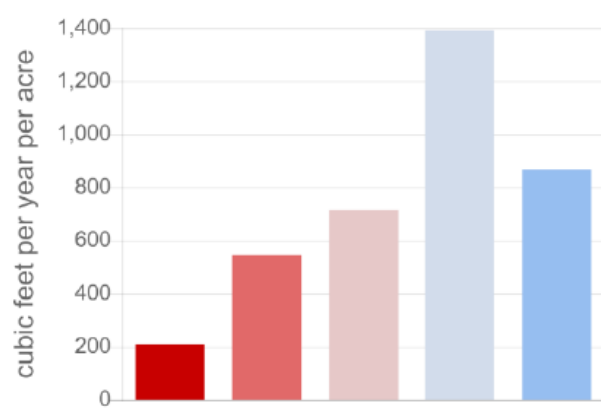
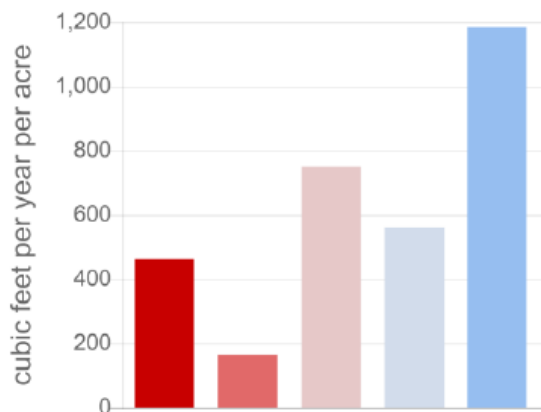
Chicago, IL

Austin, TX

Pollution
Removal
(tons per
1000 acres)



Avoided
Runoff
(cu ft/year
per acre)





Greater St. Louis, MO Social Vulnerability 3/5

Heat Island

Watershed

Population Density

City / Metro Area

SELECT CLASSES



Highest Vulnerability



High Vulnerability



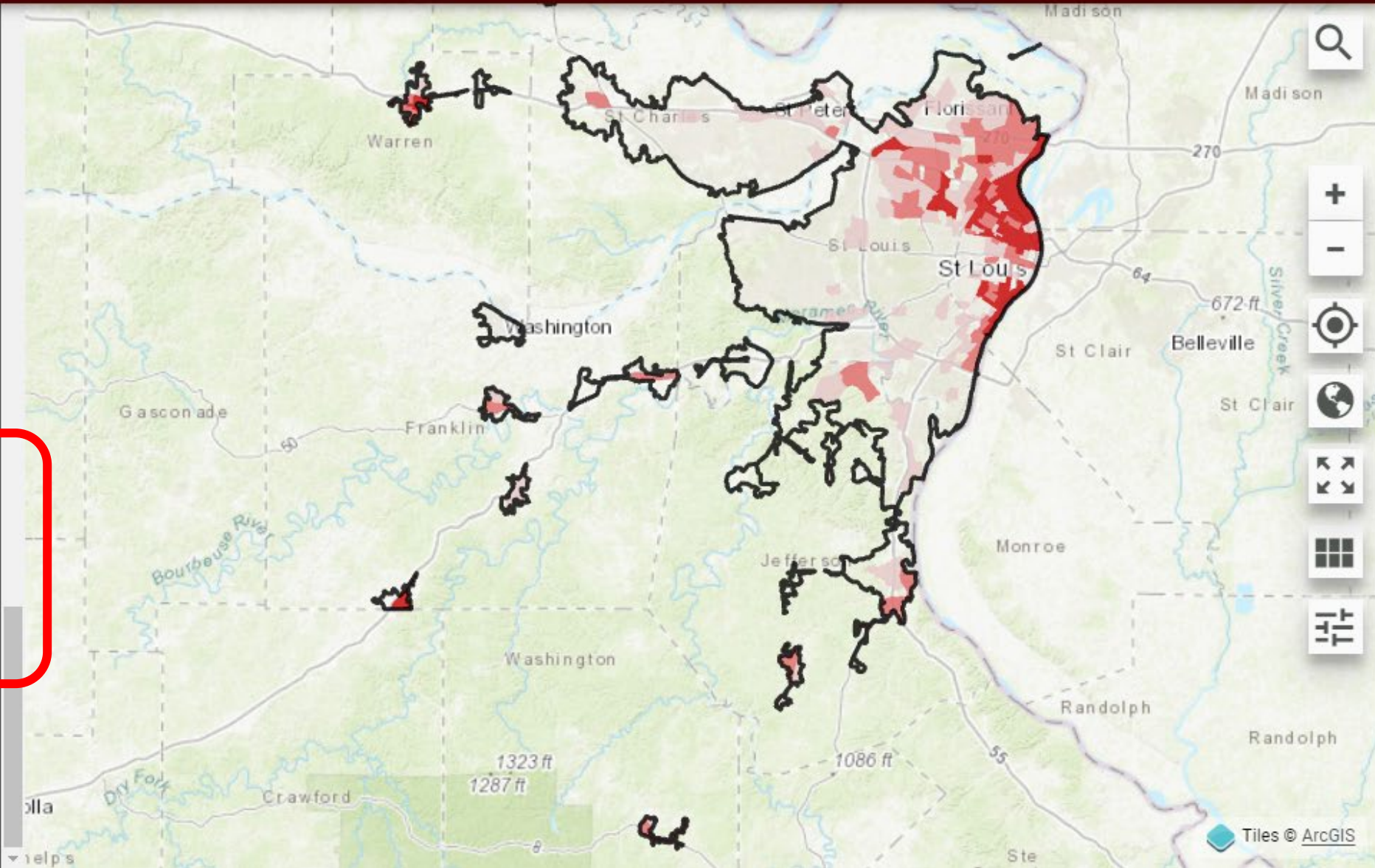
Moderate to High Vulnerabi...



Low to Moderate Vulnerabil...



Lowest Vulnerability





Greater St. Louis, MO



Social Vulnerability



2/5

Heat Island

Watershed

Population Density

City / Metro Area

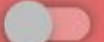
SELECT CLASSES



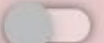
Highest Vulnerability



High Vulnerability



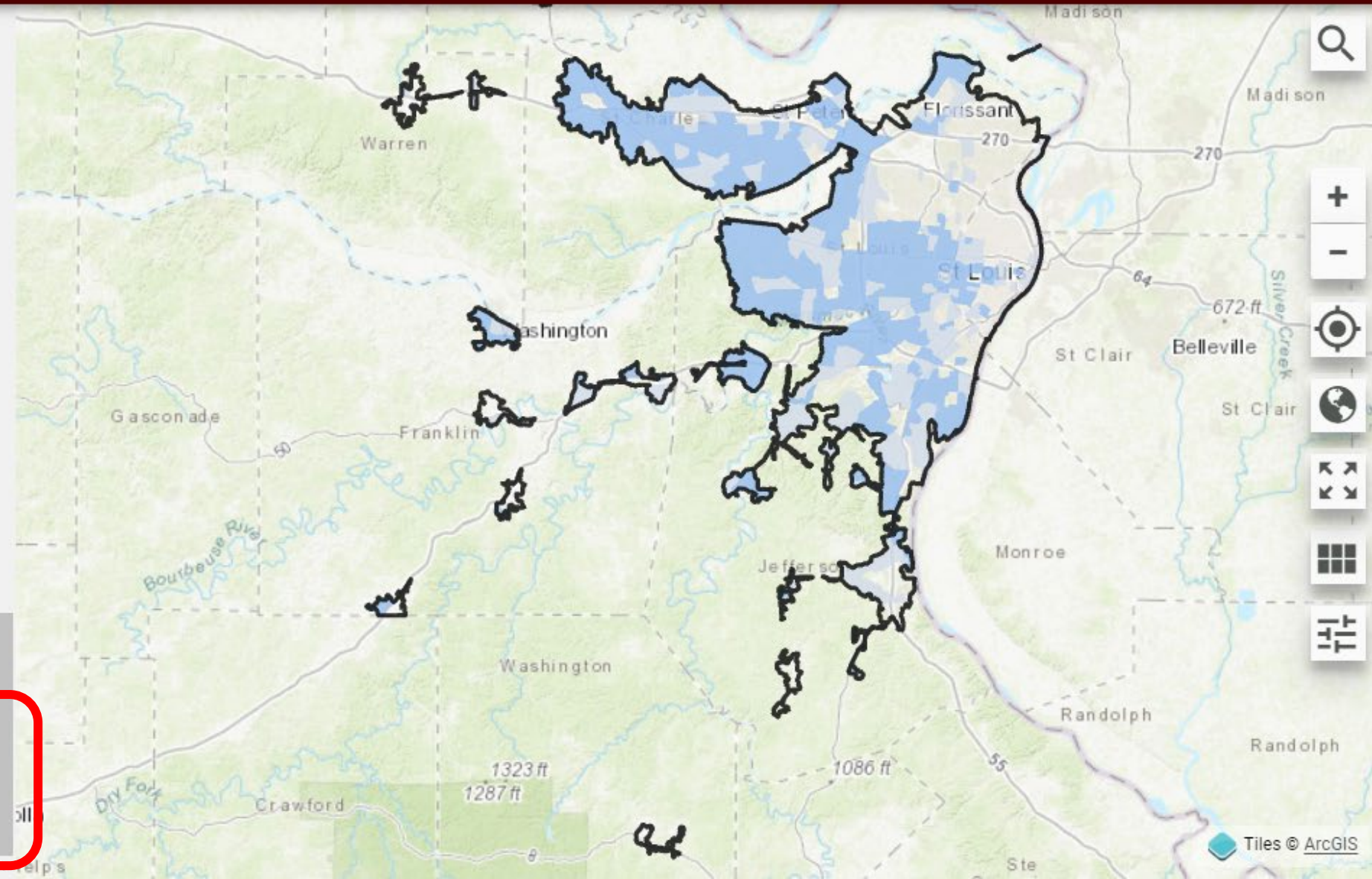
Moderate to High Vulnerabi...



Low to Moderate Vulnerabil.

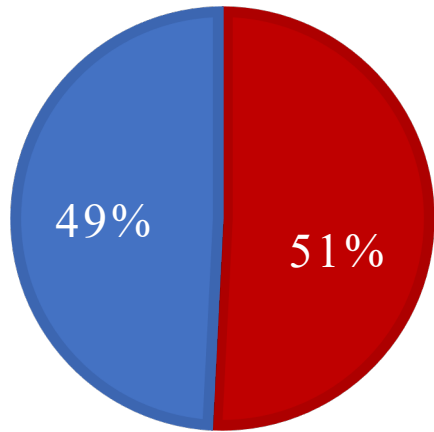


Lowest Vulnerability

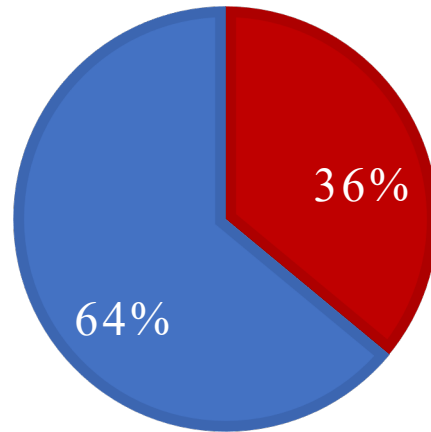


Population Distribution by SVI Class

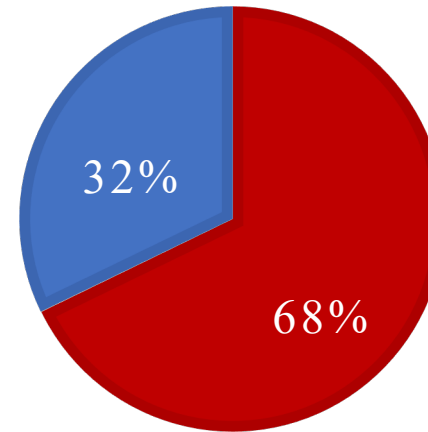
Washington, DC



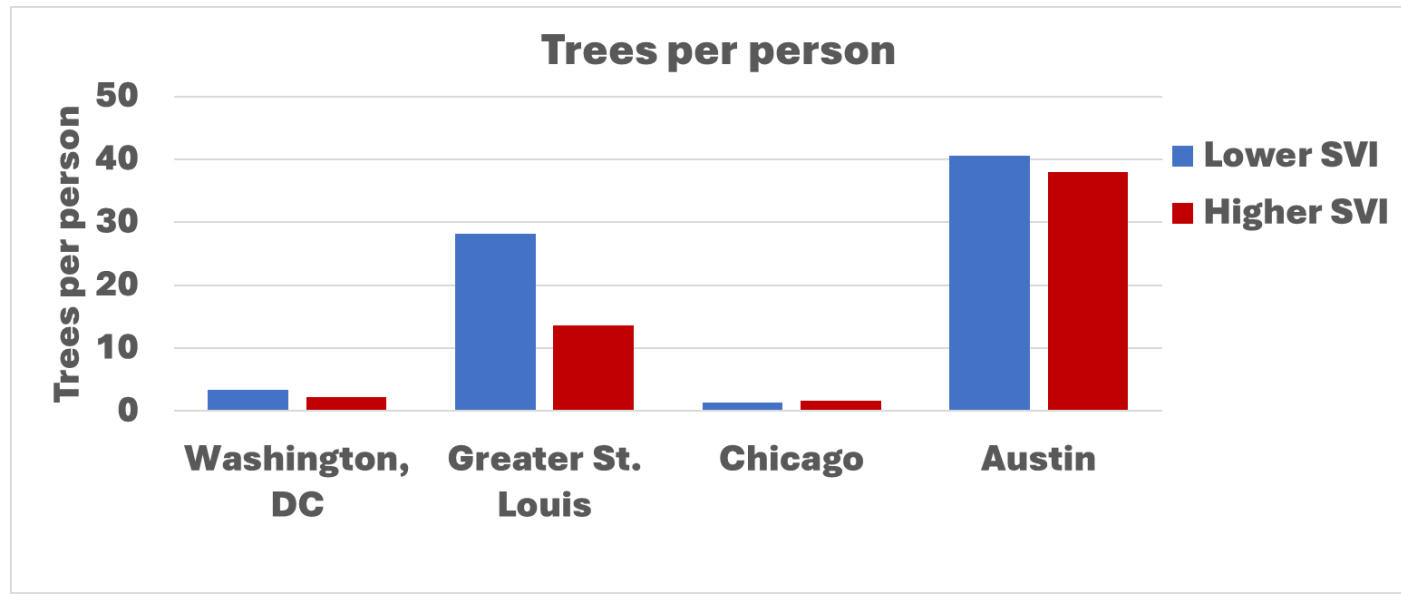
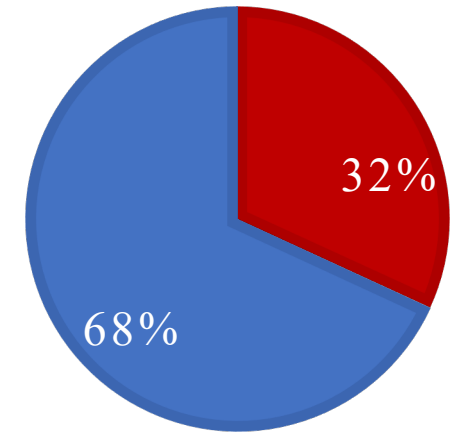
Greater St. Louis, MO



Chicago, IL



Austin, TX

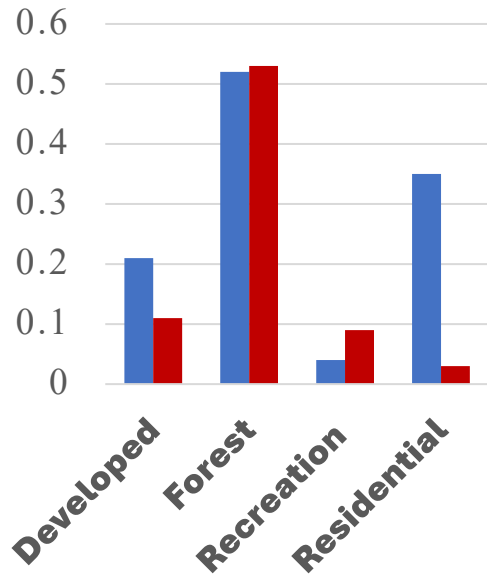


Number of Trees by Land Use and SVI

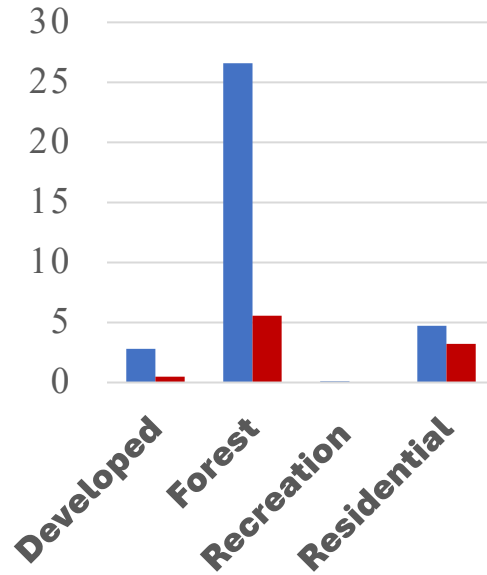
Number of trees (millions)

■ Lower SVI
■ Higher SVI

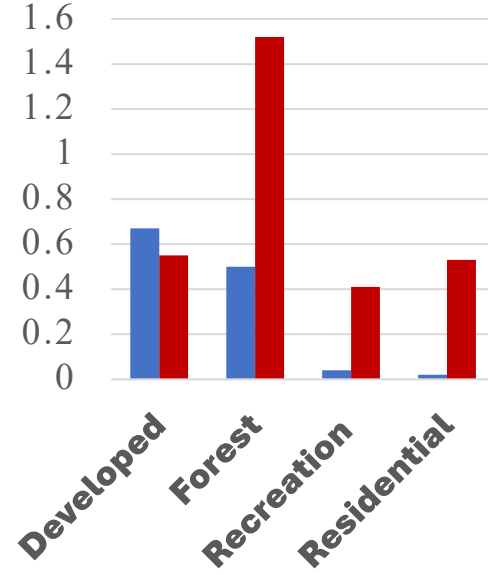
Washington, DC



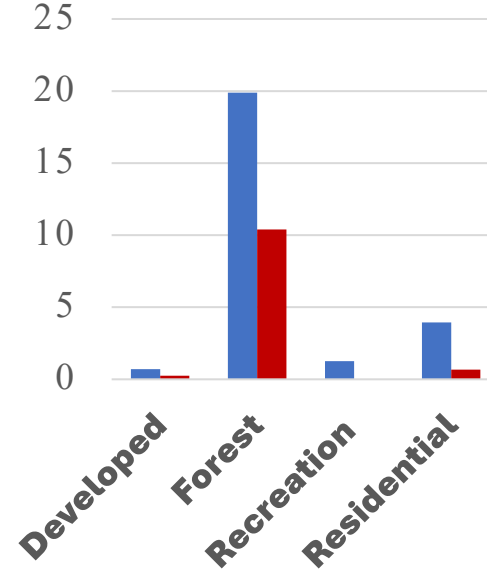
Greater St. Louis, MO



Chicago, IL



Austin, TX



	Most Common Species	Unique Spp
Lower SVI	American beech yellow poplar	74
Higher SVI	red maple American beech	45

	Most Common Species	Unique Spp
Lower SVI	eastern redcedar green ash	82
Higher SVI	eastern redcedar American elm	66

	Most Common Species	Unique Spp
Lower SVI	common buckthorn white mulberry	22
Higher SVI	common buckthorn Siberian elm	44

	Most Common Species	Unique Spp
Lower SVI	Ashe juniper Cedar elm	58
Higher SVI	cedar elm sugarberry	38

Urban Forest Stats (v. 0.0.1)

This site is for testing purposes only

Geography

San Antonio, TX 2021 Current Estimates
San Antonio, TX 2021 Current Estimates
San Diego, CA 2017 Current Estimates
San Diego, CA 2018 Current Estimates
San Diego, CA 2019 Current Estimates
San Diego, CA 2021 Current Estimates
Springfield, MO 2018 Current Estimates
Springfield, MO 2019 Current Estimates
Springfield, MO 2020 Current Estimates
St. Louis, MO 2018 Current Estimates
St. Louis, MO 2019 Current Estimates
St. Louis, MO 2021 Current Estimates
Washington, DC 2018 Current Estimates
Washington, DC 2019 Current Estimates
Washington, DC 2021 Current Estimates

Estimate numerator

Growing ground area, in square feet
Leaf Area Index
Leaf Biomass Index, in pounds per square foot
Compensatory value, in dollars
Number of live seedlings (less than 1 inch d.b.h./d.r.c.),
Gross sawlog volume of sawtimber trees, in board feet
Net sawlog volume of sawtimber trees, in board feet (l
Annual electricity use avoided, in kilowatt hours
Annual fuel use avoided, in British thermal units
Annual electricity-based carbon emissions avoided, in
Annual fuel-based carbon emissions avoided, in pound
Annual value of electricity use avoided, in dollars
Annual value of fuel use avoided, in dollars
Annual value of carbon emissions avoided, in dollars
Basal area of live mother trees (at least 1 inch d.b.h./d.
Number of live mother trees (at least 1 inch d.b.h./d.

Estimate denominator

No denominator - just produce estimates
Area of sampled land and water, in acres
Area of building cover, in acres
Area of impervious cover, in acres
Area of permeable cover, in acres
Area of herbaceous cover, in acres
Area of water cover, in acres
Area of tree cover, in acres
Number of live trees (at least 1 inch d.b.h./d.r.c.), in tre
Basal area of live trees (at least 1 inch d.b.h./d.r.c.), in s
Aboveground and belowground biomass of live and d
Area of shrub/seedling cover, in acres
Aboveground and belowground carbon in live and dea
Annual gross carbon sequestration in live trees (at leas
Annual gross carbon sequestration in live trees (at leas

Row variable

Damage type - stem girdling
Damage type - topping or pruning
Density class
Diameter check
Diameter class
FIA land use
Land cover class
Maintained area for seedlings
Mtree Crown dieback
Mtree Crown exposed to light
Mtree Diameter check
Mtree Diameter class
Mtree Species common name
Mtree Species group code
Mtree Species scientific name
Mtree Tree planted

Column variable

Condition status
Cover class
Crown class
Damage type - bark inclusion
Damage type - excessive mulching
Damage type - improper planting
Damage type - overhead wires
Damage type - sidewalk-root conflict
Damage type - stem girdling
Damage type - topping or pruning
Density class
Diameter check
Diameter class
FIA land use
Land cover class

Additional grouping variable

None
Abnormal stem termination
Afforested
Bole stump removed
Canopy cover method
Cause of death
Condition status
Cover class
Crown class
Damage type - bark inclusion
Damage type - excessive mulching
Damage type - improper planting
Damage type - overhead wires
Damage type - sidewalk-root conflict
Damage type - stem girdling

+ Add Condition Filter(s)

+ Add Tree Filter(s)

HTML

Show Results

Output

Estimate Parameters

Estimate: Area of herbaceous cover,
Geography: StLouis2021Curr
Grouping Variables:
- FIA land use
- Nonsampled reason

Note: '-' indicates no value for data ta
reader, it is recommended to adjust v
screen reader settings.

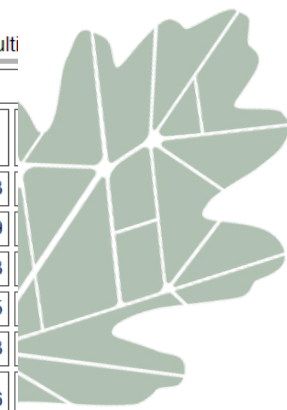
Estimate:

FIA land use	Total
Total	222,630
Forest land	21,937
Agriculture	2,120
Commercial/Industrial	37,160
Residential	121,361
Multi-family Residential	2,204
Recreation/Cemetery	16,795
Rights-of-Way	20,869

Sampling error percent level 68%):

Note: for 95% confidence level multi

FIA land use	Total
Total	3,653
Forest land	17,689
Agriculture	87,973
Commercial/Industrial	16,085
Residential	6,923
Multi-family Residential	38,676
Recreation/Cemetery	26,090
Rights-of-Way	19,469





Highlights:

- The pool of urban FIA data is growing.
- My City's Trees provides users easy access to Urban FIA data and more tools are in development.
- The social vulnerability theme in the MCT app helps users explore the equity of tree resources and benefits in a city.
- The data suggest that in select cities like Greater St. Louis and Washington, DC more socially vulnerable tracts may have lower tree density and tree benefits, but further research and exploration of sampling errors is needed.

Urban FIA is working on:

- State or region-level urban forest analyses
- Analyses of remeasurement data
- Annual reporting of urban FIA data and the development of online, interactive content/dashboards





Thank you

Tonya Lister, USDA Forest Service, FIA

✉ tonya.lister@usda.gov

Links:

UFIA website <https://www.fia.fs.usda.gov/program-features/urban/>

My City's Trees App <https://mct.tfs.tamu.edu/app>



2nd **World** **Forum on** **Urban** **Forests**

2023



**World Forum on
Urban Forests**



2nd World Forum on Urban Forests

Washington DC, 2023

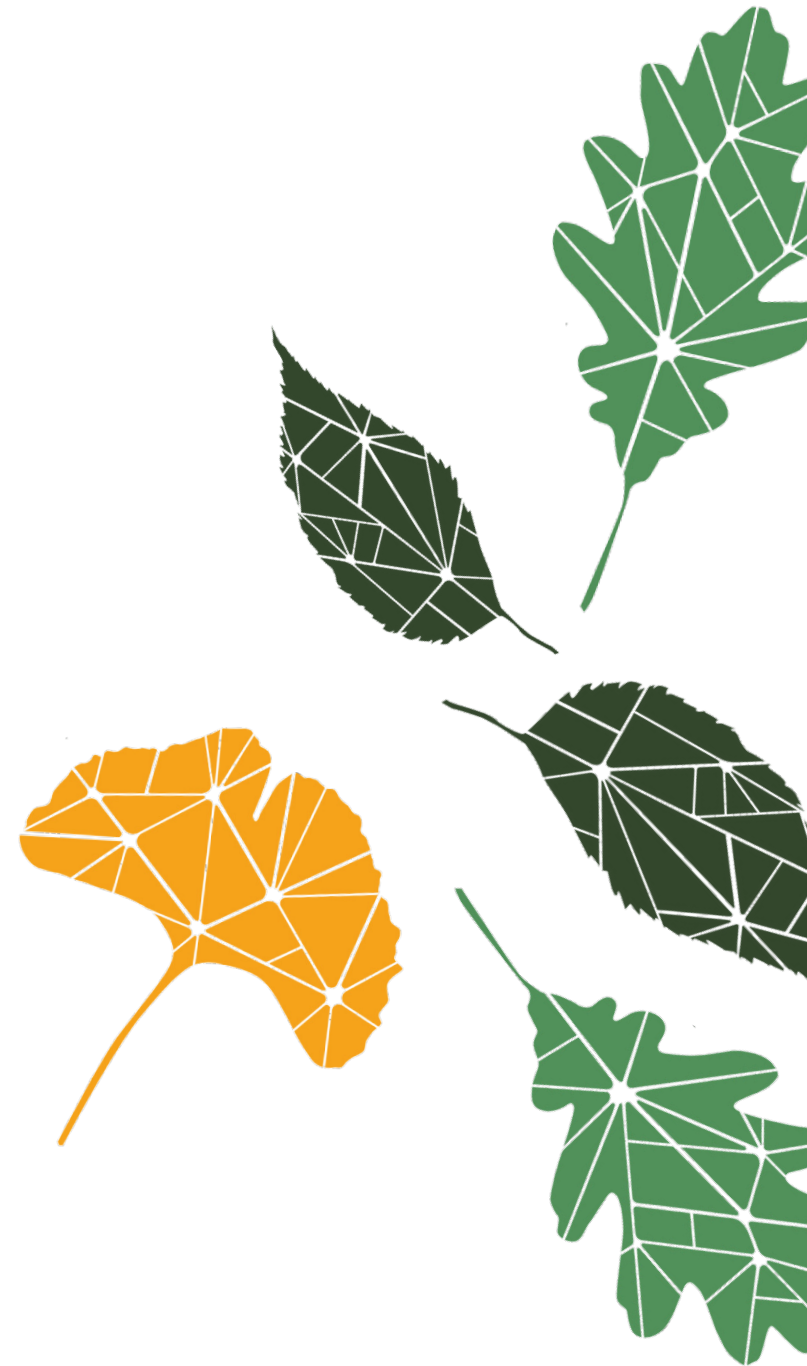
Inclusive Cities

Branding and Identity in Arboriculture
– Why it matters in expanding
diversity



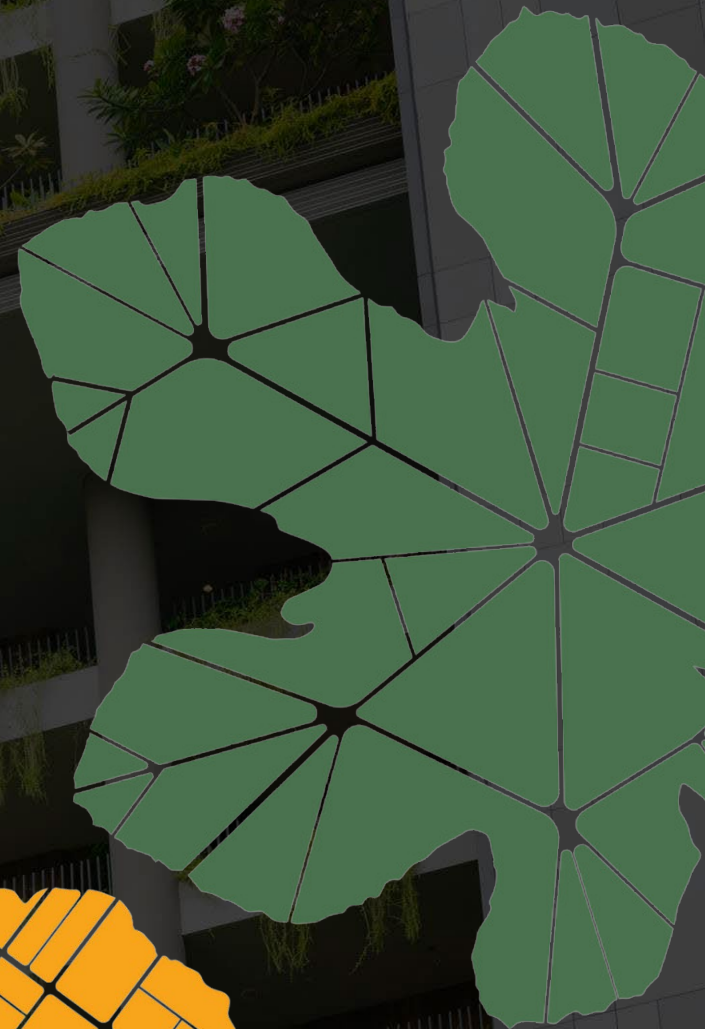
Presented by

Luana Vargas
International Society of Arboriculture
ATD Certified Professional in Talent
Development



What's in a brand?

A compilation of written, verbal, and nonverbal cues that tells a story about your product or service.





**2nd World Forum on
Urban Forests**

Washington DC, 2023

This was our brand...

**What messages or
stories does it
convey?**



TM

The data behind it, declines or stagnation in:

- Overall number of credentials held
- Female credential holders





What did we do with the findings?

**Top
Manage
ment**

**Marketi
ng Firm**

**SME
Support**



Brand naming and design evolution





**2nd World Forum on
Urban Forests**

Washington DC, 2023



Our new look





Does it stop here with the rebrand?

- Intentionality of inclusion through different media
- Building diversity and inclusion inside and out





Intentional, inclusive language and imagery





2nd World Forum on Urban Forests

Washington DC, 2023





Thank you

**Luana Vargas | International Society
of Arboriculture**

 **lvargas@isa- arbor.com**



Food and Agriculture
Organization of the
United Nations



Arbor Day
Foundation



International Society of Arboriculture



Smithsonian



FOREST SERVICE
U.S.
DEPARTMENT OF AGRICULTURE



CEUs

Session 2.3: Castle in the Sky: Creating and sharing new knowledge and supporting education on equitable access to ecosystem services



PP-23-3564



**World Forum on
Urban Forests**