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

2nd World Forum on Urban Forests

Washington DC, 2023

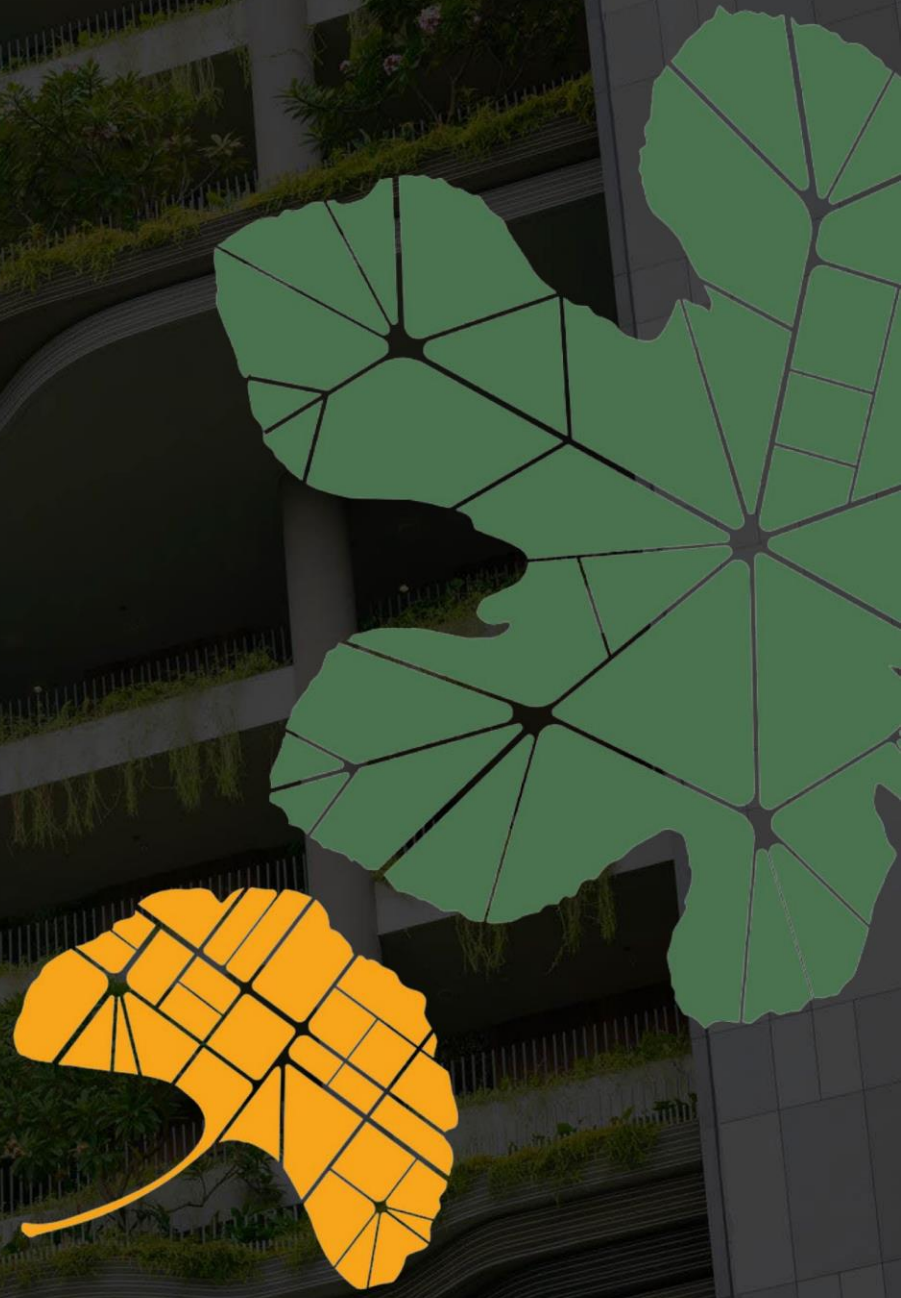
Co–authors

Clive Davies	Newcastle University | MD2 | EFI | EFUF
Lotte Dijkstra	Newcastle University | Studio PLACES
Simone Borelli	FAO
Fabio Salbitano	University of Sassari | SISEF
Michela Conigliaro	FAO
Cleona Wallace	FAO eLearning Academy

Background

The potential

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

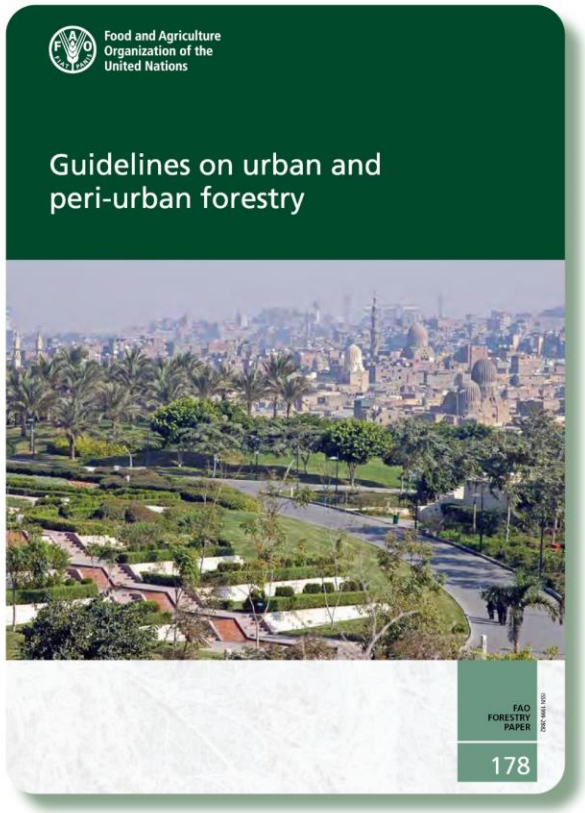


Background

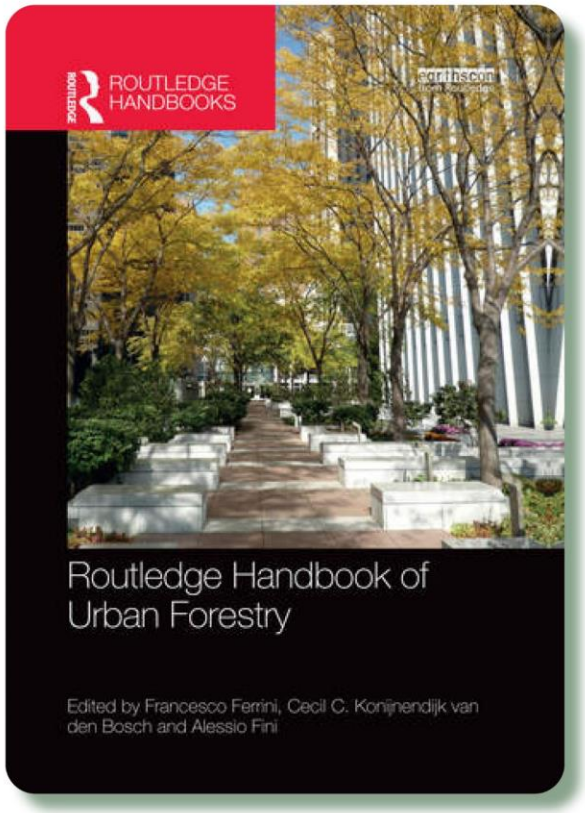
The challenge

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

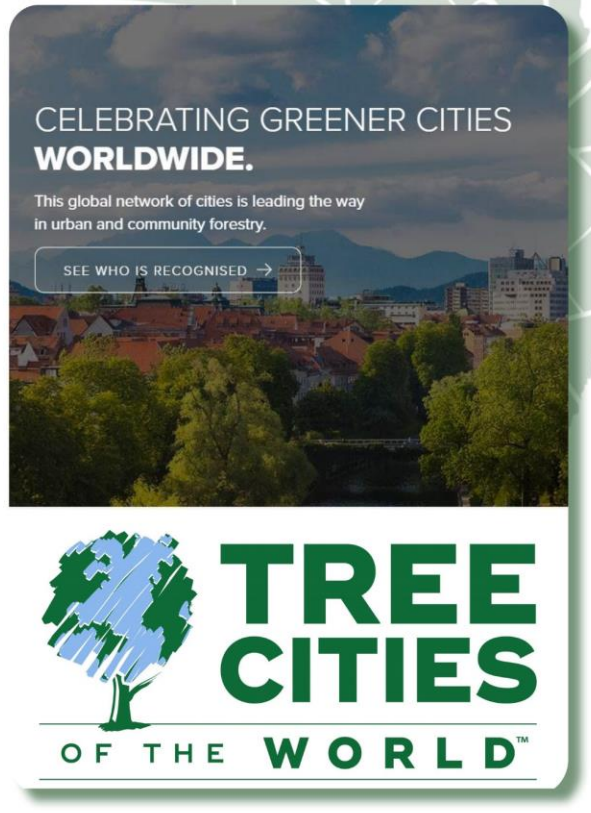
Body of knowledge



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?

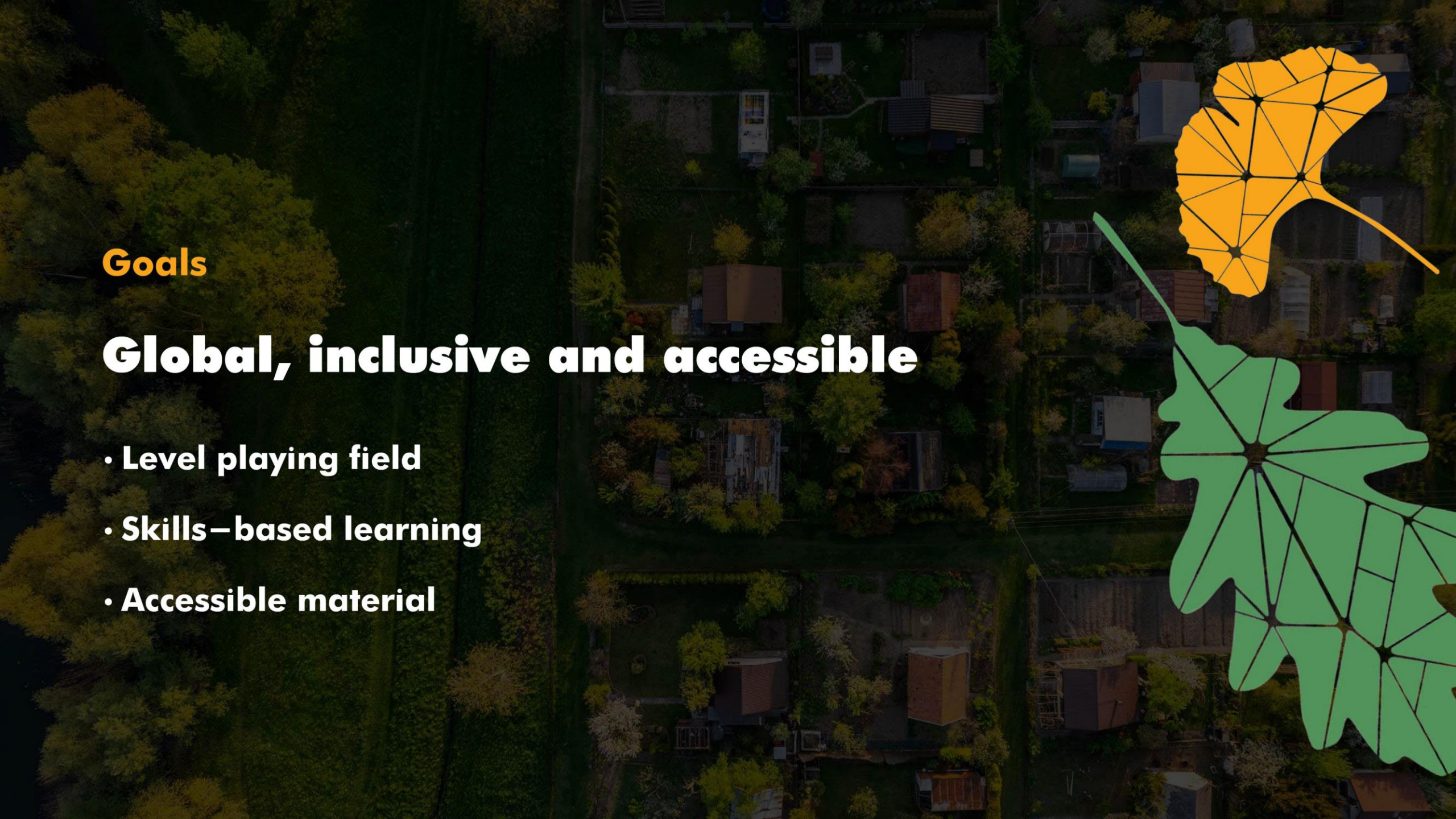
Conversation starters

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

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

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

Creators

Clive Davies
Newcastle University |
MD2 | EFI | EFUF

Lotte Dijkstra
Newcastle University |
Studio PLACES

Creators

Clive Davies
Newcastle University |
MD2 | EFI | EFUF

Lotte Dijkstra
Newcastle University |
Studio PLACES

Advisory team

Simone Borelli
FAO

Michela Conigliaro
FAO

Fabio Salbitano
University of Sassari |
SISEF

Cristina Petracchi
FAO eLearning Academy

Creators

Clive Davies
Newcastle University |
MD2 | EFI | EFUF

Lotte Dijkstra
Newcastle University |
Studio PLACES

Advisory team

Simone Borelli
FAO

Michela Conigliaro
FAO

Fabio Salbitano
University of Sassari |
SISEF

Cristina Petracchi
FAO eLearning Academy

Peer review

Cynnamon Dobbs
University of Connecticut

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

Thomas B. Randrup
Swedish University of
Agricultural Sciences

Creators

Clive Davies
Newcastle University | MD2 | EFI | EFUF

Lotte Dijkstra
Newcastle University | Studio PLACES

Storyboards

Cleona Wallace
FAO eLearning Academy

Advisory team

Simone Borelli
FAO

Michela Conigliaro
FAO

Fabio Salbitano
University of Sassari | SISEF

Cristina Petracchi
FAO eLearning Academy

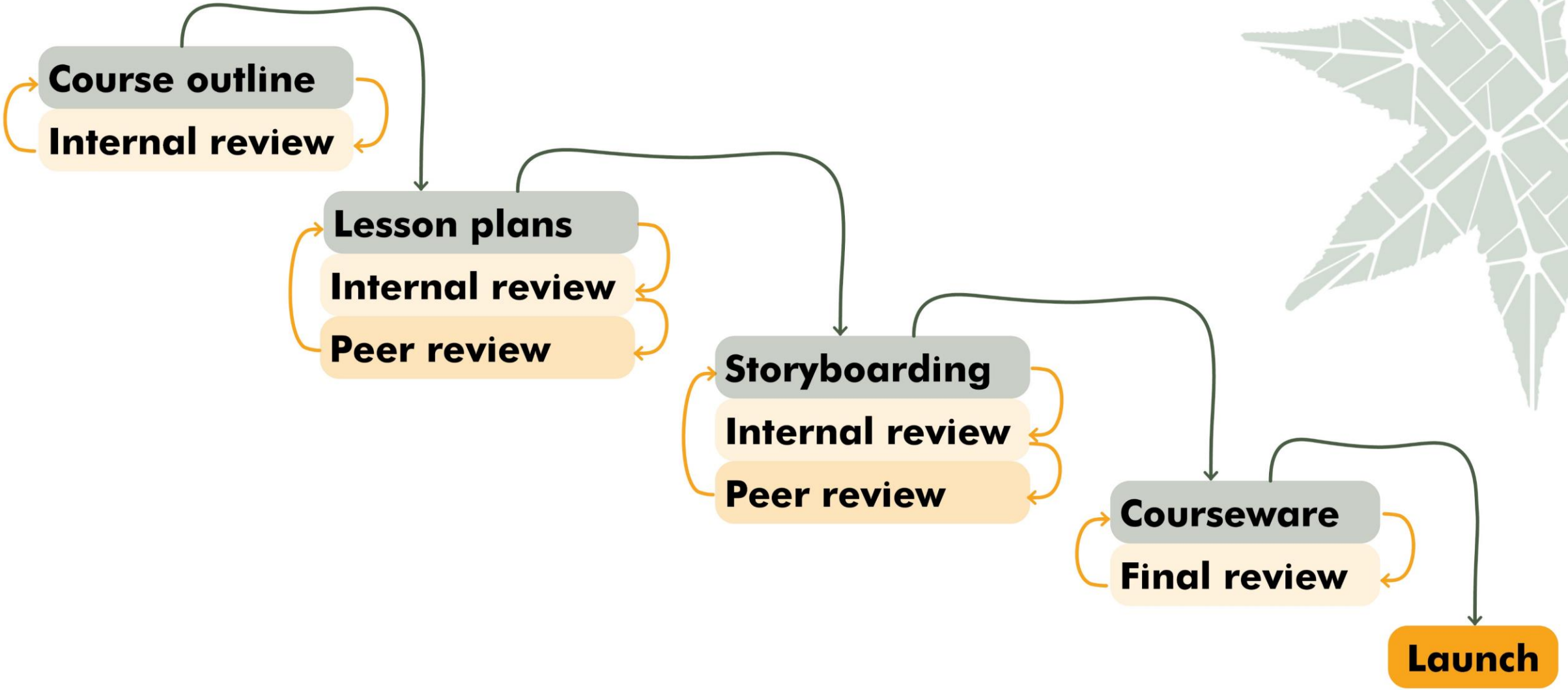
Peer review

Cynnamon Dobbs
University of Connecticut

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

Thomas B. Randrup
Swedish University of Agricultural Sciences

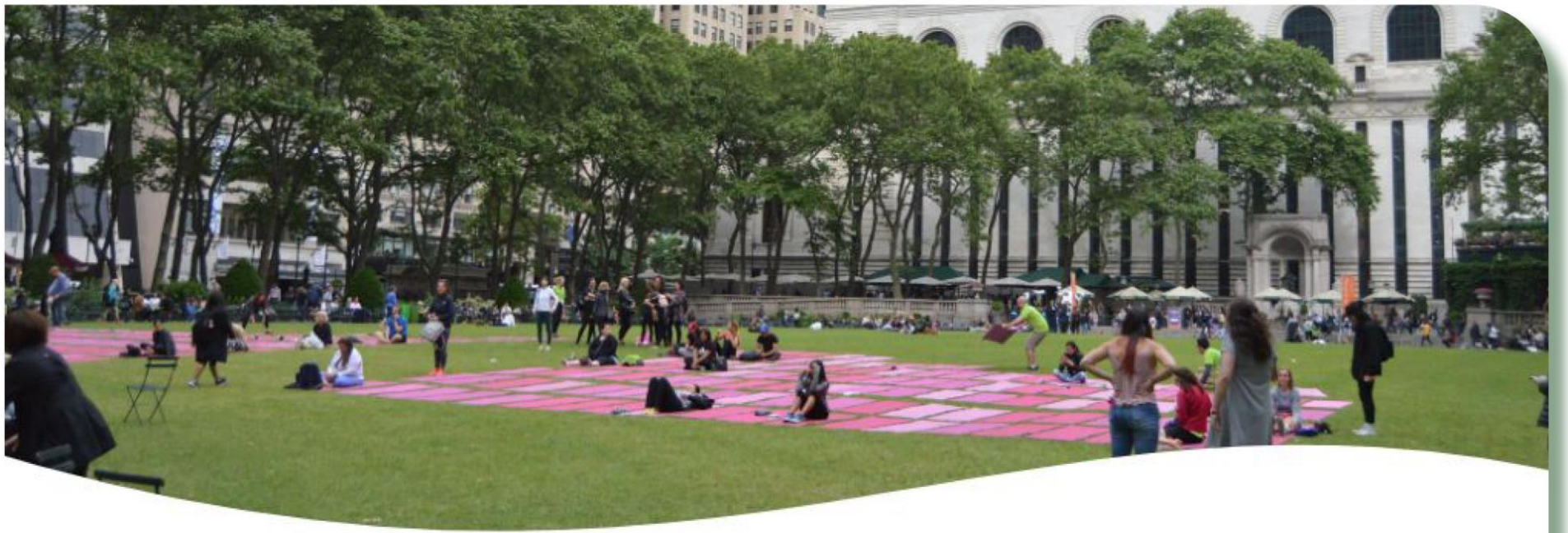
Process


Course outline
Internal review
Lesson plans
Internal review
Peer review
Storyboarding
Internal review
Peer review
Courseware
Final review
Launch

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



About this course

Welcome to this course on Urban Forestry

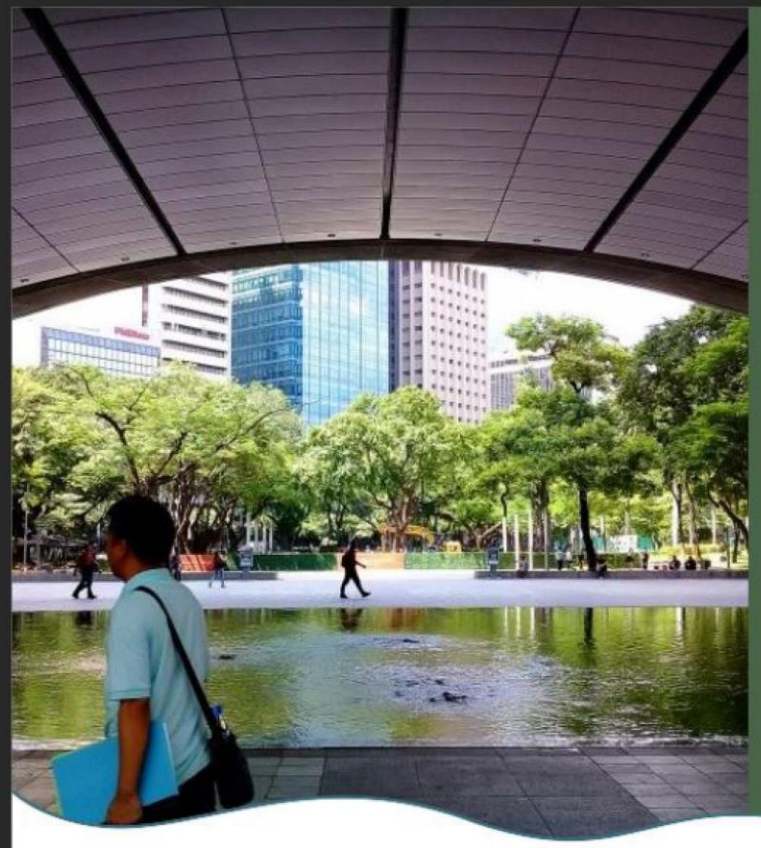
This e-learning course aims to provide an **introductory** and **elementary understanding** of **urban** and **peri-urban forestry** concepts. It focuses on issues around definitions and introduces ideas around the planning, design and management of urban and peri-urban forests.

MENU GLOSSARY RESOURCES

Introduction to Urban and Peri-Urban Forestry

EXIT

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)**.

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

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

- 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 deepend 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

elearning.fao.org

Food and Agriculture Organization of the United Nations

العربية 中文 English Français Русский Español

Google Search on fao.org

FAO elearning Academy

About the Academy | What we do | Courses | Certification | Webinars | Repository | Partners | Help and support | You are not logged in. (Log in) Register

Search by keyword | Search by thematic area

Explore our wide variety of free, multilingual courses in the areas of food and nutrition security, social and economic developmentand sustainable management of natural resources, all supporting the Sustainable Development Goals (SDGs).

Thematic areas | New | Certification | Mobile-Friendly

Submit | Reset

Minimum dietary diversity for women

SEPTEMBER 2023 1 h 40 m

Planning seed and seedling supply for forest and landscape restoration

SEPTEMBER 2023 2 h

Bivalve Mollusc Sanitation: Growing Area Monitoring

SEPTEMBER 2023 2 h 30 m

Mitigating the impact of irrigation infrastructure on fish migration

SEPTEMBER 2023 2 h 30 m

Invite your local...

- Policymakers
- 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

C.M.Dijkstra2@newcastle.ac.uk
@studio.places
@studio_places

Food and Agriculture Organization of the United Nations
Arbor Day Foundation
POLITECNICO MILANO 1863
ISA
Smithsonian

2nd World Forum on Urban Forests

2023

World Forum on Urban Forests

2nd World Forum on Urban Forests

Washington DC, 2023

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

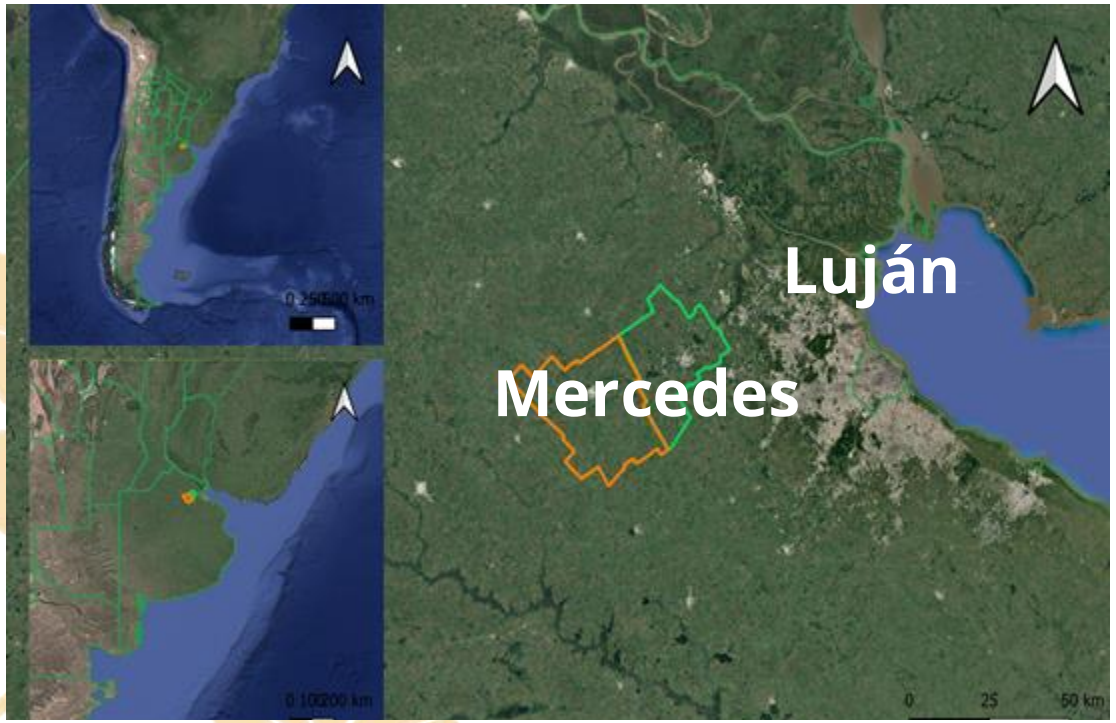
Presented by

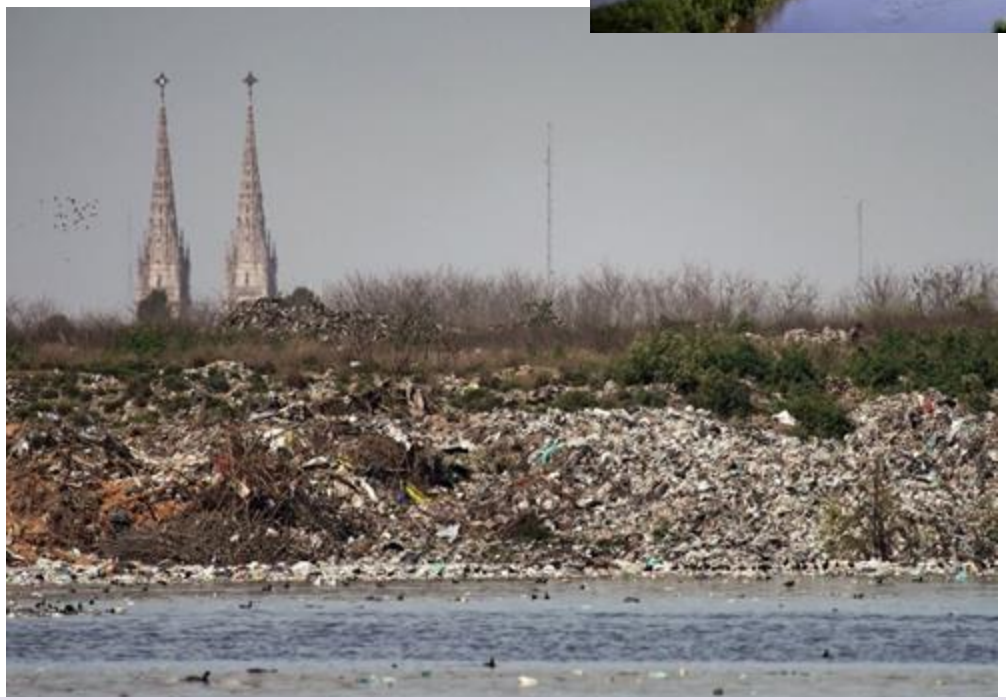
Dra. Ing. Elena B. Craig

Ing. Analía Scarselletta
Dra. Clara Minaverry
Lic. Macarena Pocaressi

CONICET
UNIVERSIDAD NACIONAL DE LUJÁN
I N E D E S
MUNICIPIO DE LUJÁN
UNIVERSIDAD NACIONAL DE LUJÁN
mercedes ciudad de todos

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

2nd World Forum on Urban Forests
Washington DC, 2023

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 Cucciufo, 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 periódica, año 11, número 22, Santa Fe, República Argentina, pp. 15-27.

SOCIAL PARTICIPATION MECHANISMS

ENVIRONMENTAL EDUCATION MECHANISMS

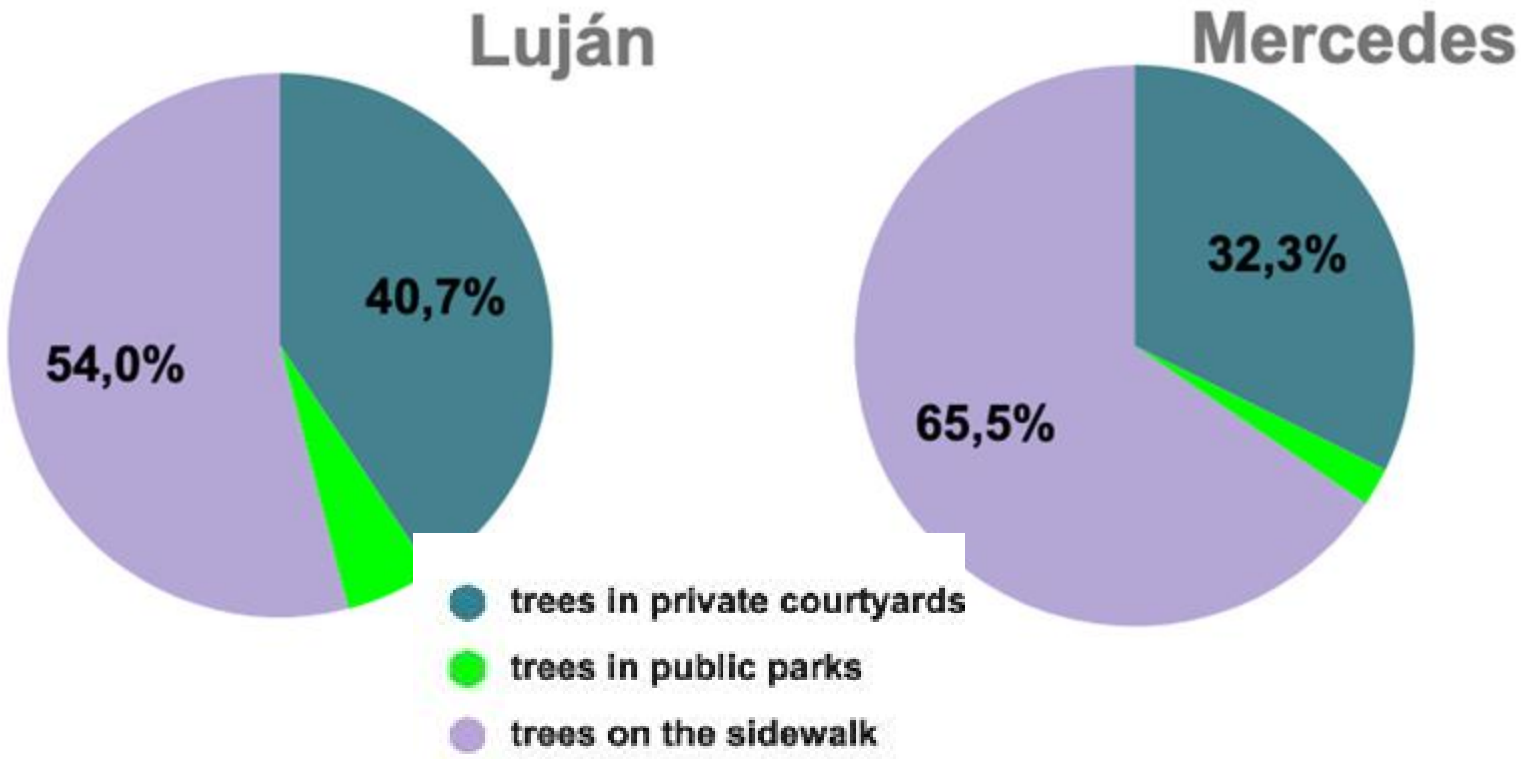
Exploring the role of Local Communities in Urban Governance

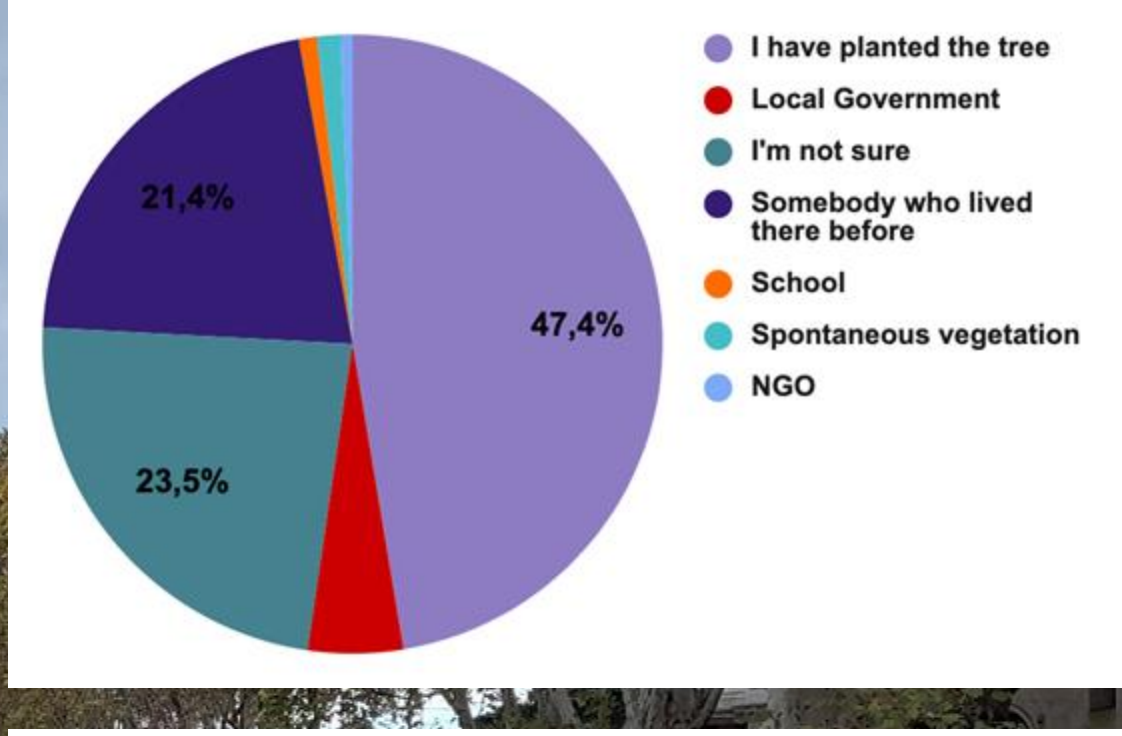
METHODOLOGY

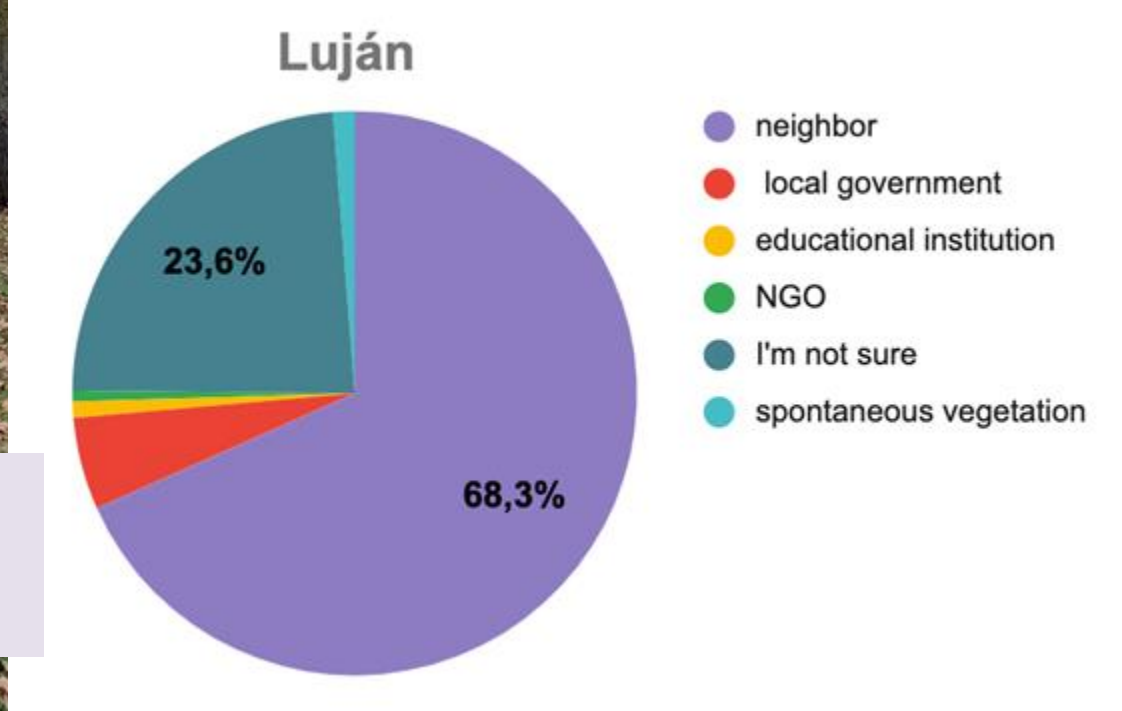
20 SPECIALIST INTERVIEWS

790 COMMUNITY SURVEY

Identifying the Tree
that holds the closest connection to you







Who has planted the trees in your sidewalk?

Neighbors perceptions about ecosystem services

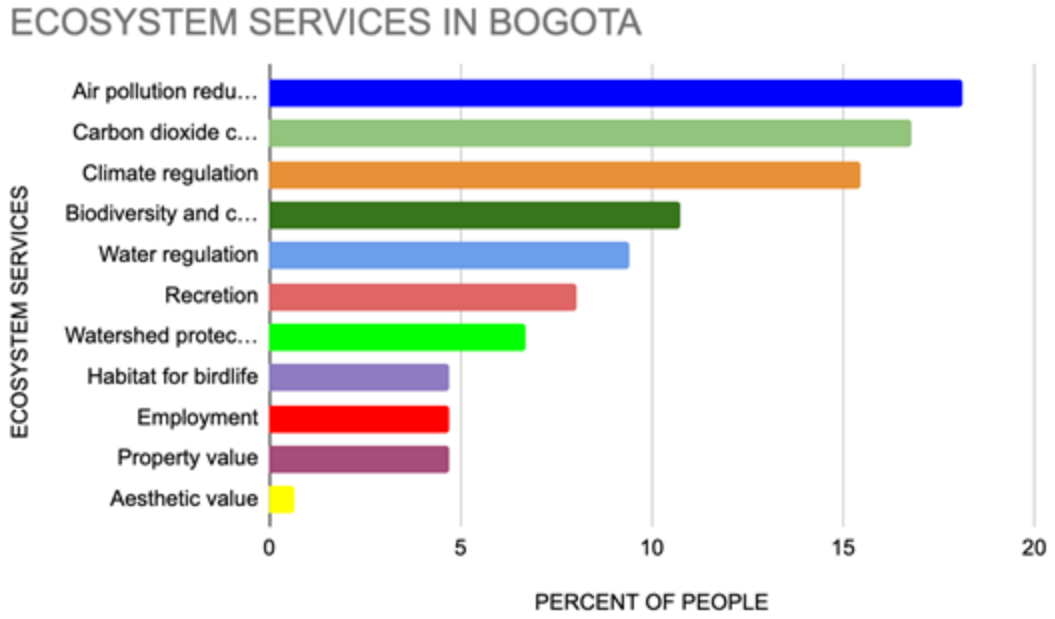
Of the bare forests
Juan Carlos Brambiya

Paint: White forest, black root

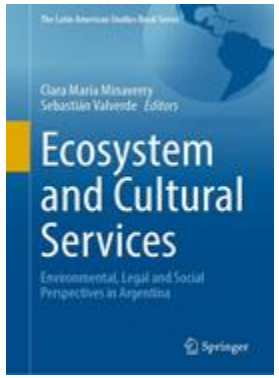
Who plays a role of taking care for trees, and what aspects do local community value about them?

2nd World Forum on Urban Forests
Washington DC, 2023

Approach about local perception of ecosystem



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.



Interviews with urban forest specialists

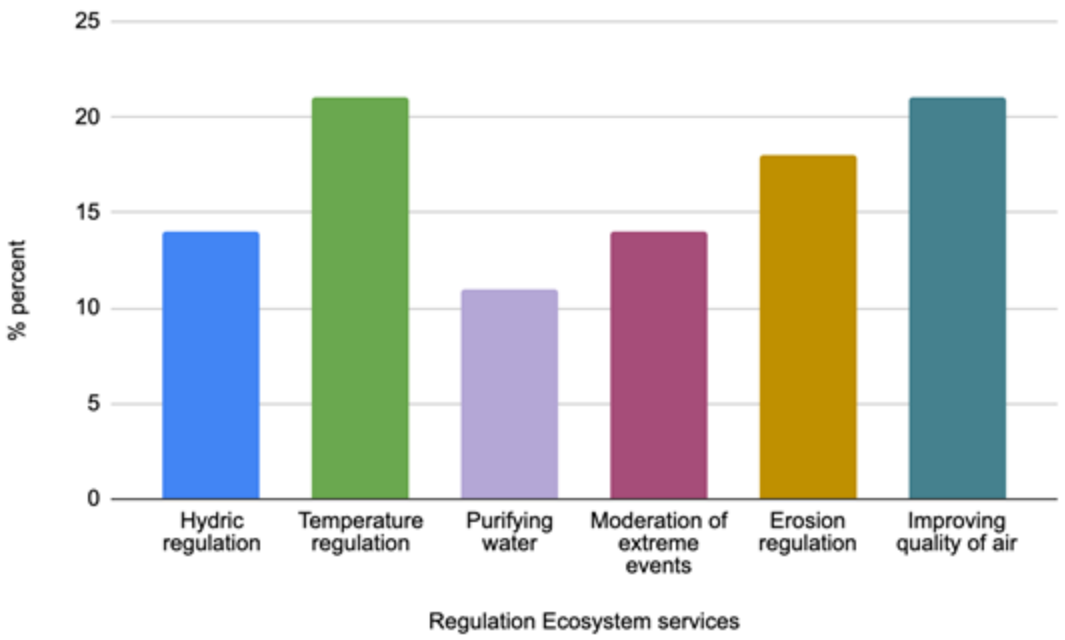


Fig. X.5: Average score for each of the regulation or sustainability services offered by urban forests. (1 means "It does not contribute to the service" and 5 means "It successfully contributes to the service"). Key informants' responses; surveys conducted during 2019. Compiled by the authors

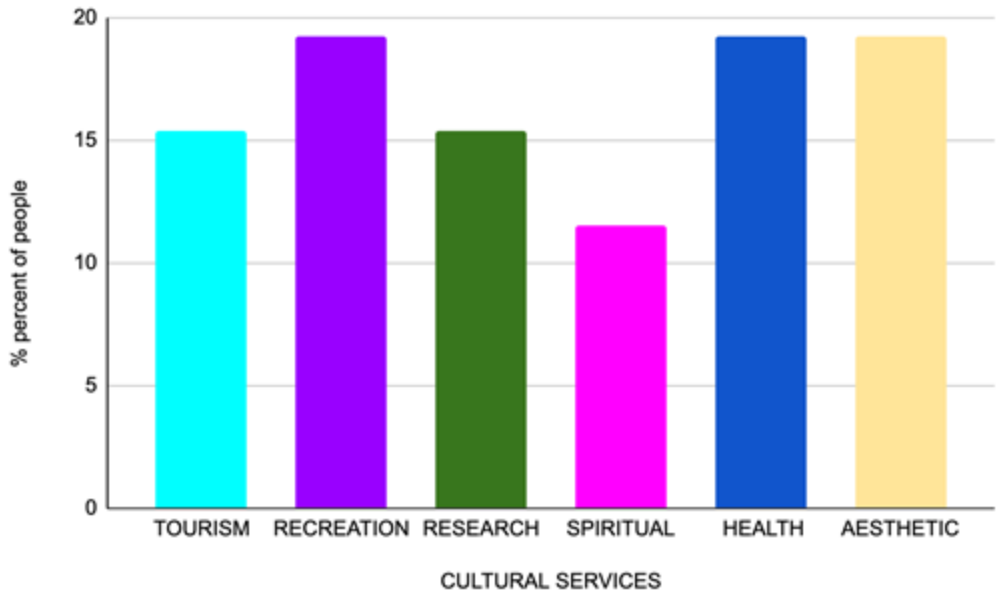
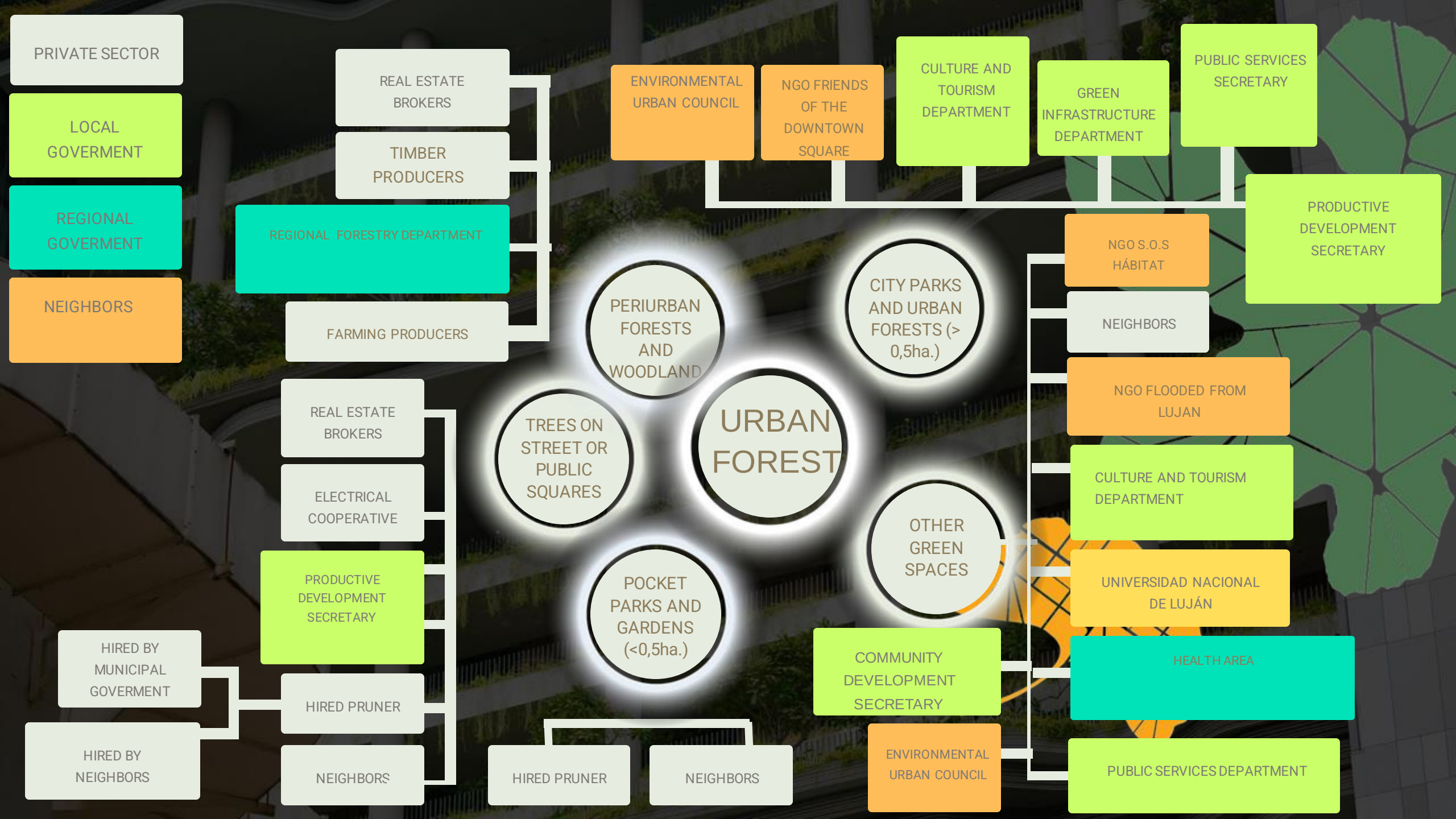


Fig. X.6:Average score for each of the cultural services offered by urban forests. (1means "It does not contribute to the service" and 5 "It successfully contributes to the service"). Key informants' responses; surveys conducted during 2019. Compiled by the author

The urban forest model at the outset of this project


PRIVATE SECTOR
LOCAL GOVERMENT
REGIONAL GOVERMENT
NEIGHBORS
REAL ESTATE BROKERS
TIMBER PRODUCERS
REGIONAL FORESTRY DEPARTMENT
FARMING PRODUCERS
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 LUJAN
CULTURE AND TOURISM DEPARTMENT
UNIVERSIDAD NACIONAL DE LUJÁN
HEALTH AREA
PUBLIC SERVICES DEPARTMENT
ENVIRONMENTAL URBAN COUNCIL
COMMUNITY DEVELOPMENT SECRETARY
PERIURBAN FORESTS AND WOODLAND
CITY PARKS AND URBAN FORESTS (> 0,5ha.)
TREES ON STREET OR PUBLIC SQUARES
URBAN FOREST
OTHER GREEN SPACES
POCKET PARKS AND GARDENS (<0,5ha.)
REAL ESTATE BROKERS
ELECTRICAL COOPERATIVE
PRODUCTIVE DEVELOPMENT SECRETARY
HIRED PRUNER
NEIGHBORS
HIRED BY MUNICIPAL GOVERMENT
HIRED BY NEIGHBORS
HIRED PRUNER
NEIGHBORS

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

Universidad Nacional de Luján

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

CIEF

ISA

Smithsonian

2nd World Forum on Urban Forests

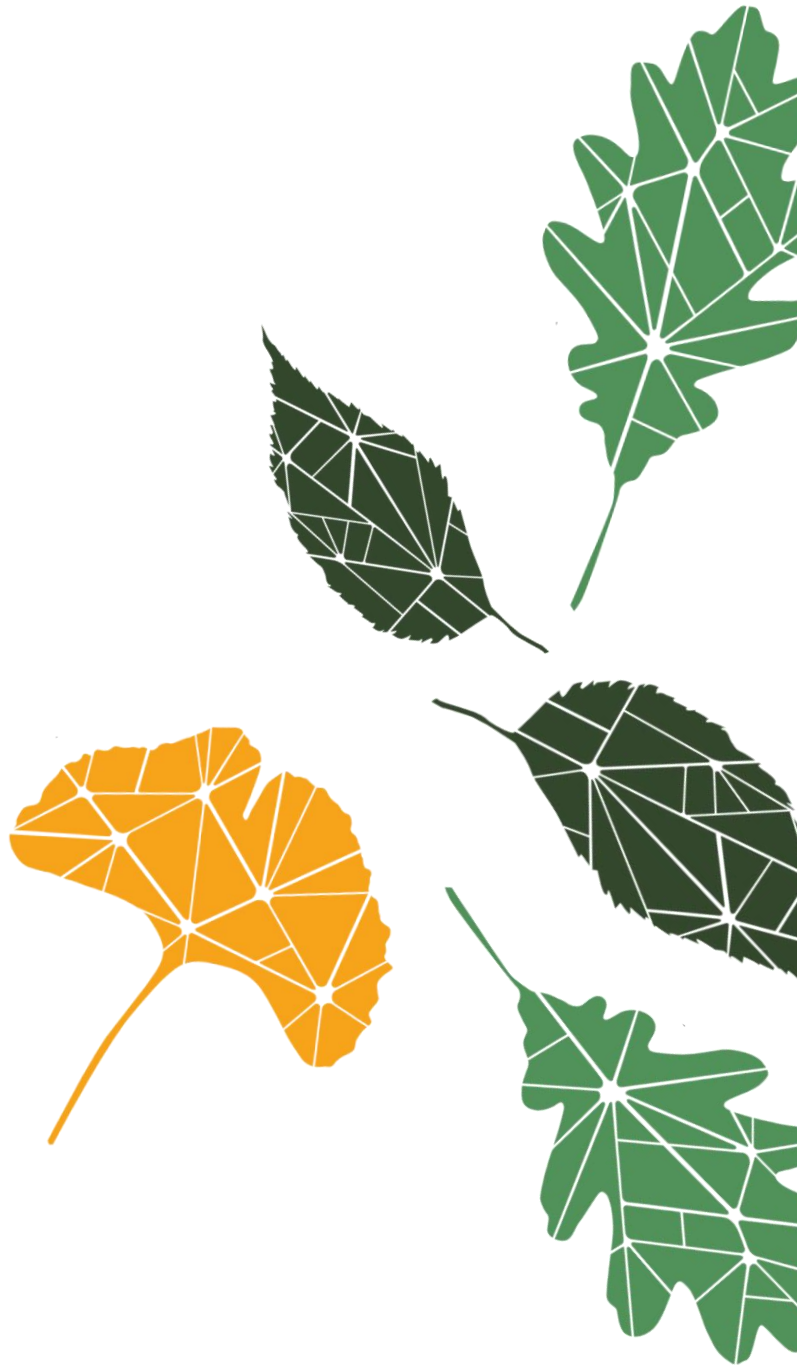
2023

World Forum on Urban Forests

2nd World Forum on Urban Forests

Washington DC, 2023

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

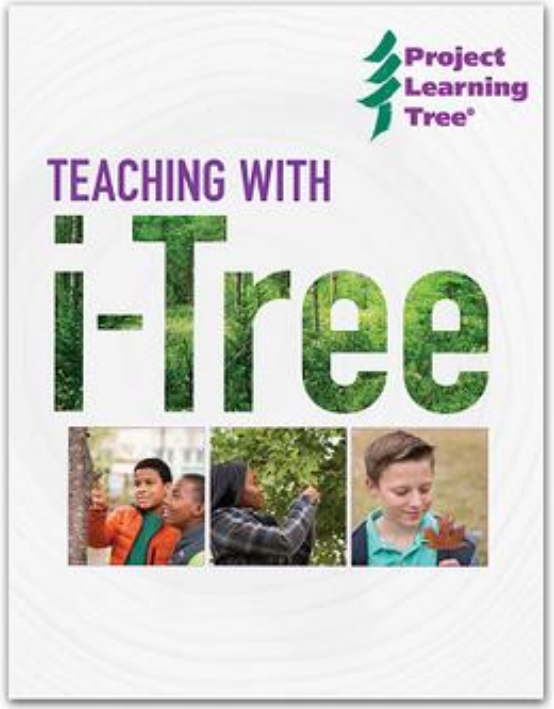
Core canopy tools

"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

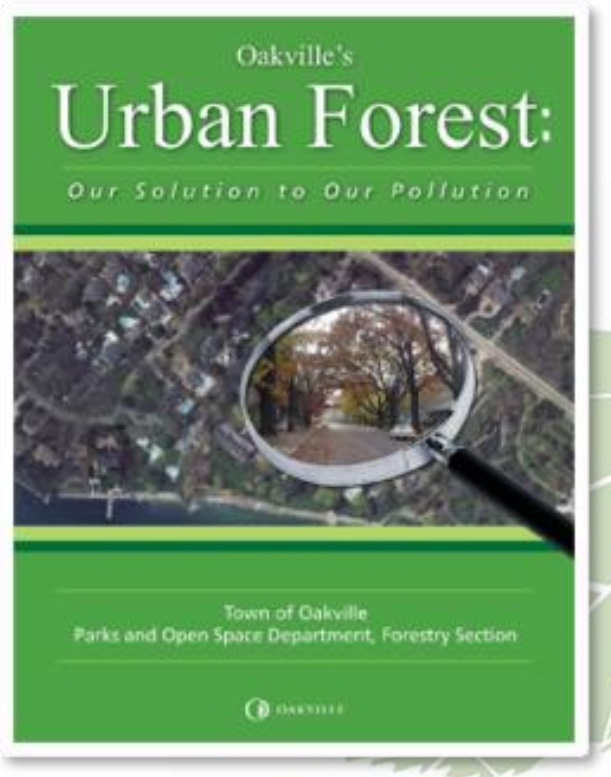


Advocacy

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

Strategic Management

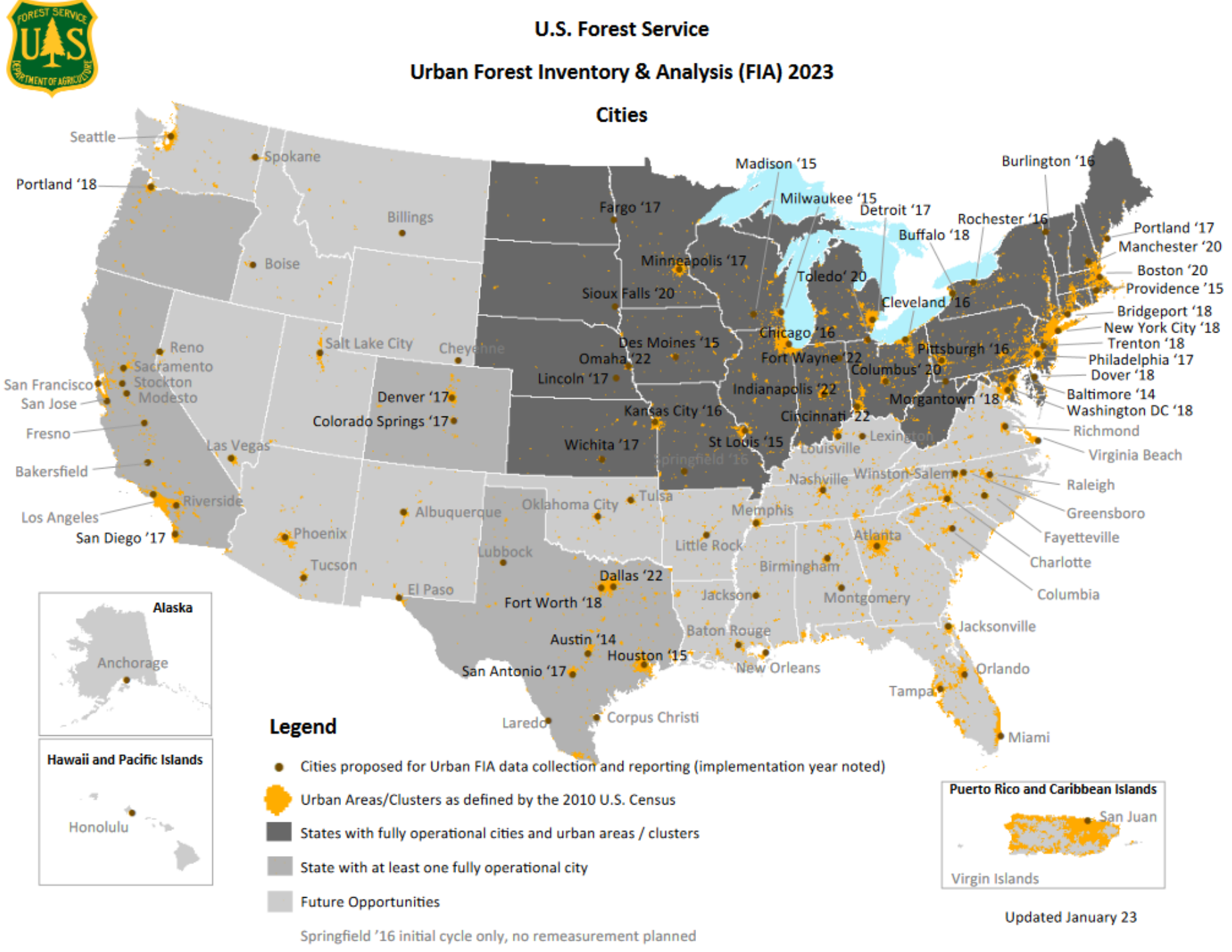
- Decide where to plant trees
- Support care, maintenance, and protection of trees
- Monitor and optimize investments in trees



2nd World Forum on Urban Forests
Washington DC, 2023

Urban Forest Inventory & Analysis (FIA)

The Nation's Urban Forest Inventory



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

FY2023 Urban FIA Name:

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

Check for updates

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

James A. Westfall[1] · David J. Nowak[2] · Jason G. Henning[3] · Tonya W. Lister[1] · Christopher B. Edgar[4] · Mark A. Majewsky[5] · Nancy F. Sonti[6]

Published online: 19 March 2020
© This is a U.S. Government work and not under copyright protection in the US; foreign copyright protection may apply 2020

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 ±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

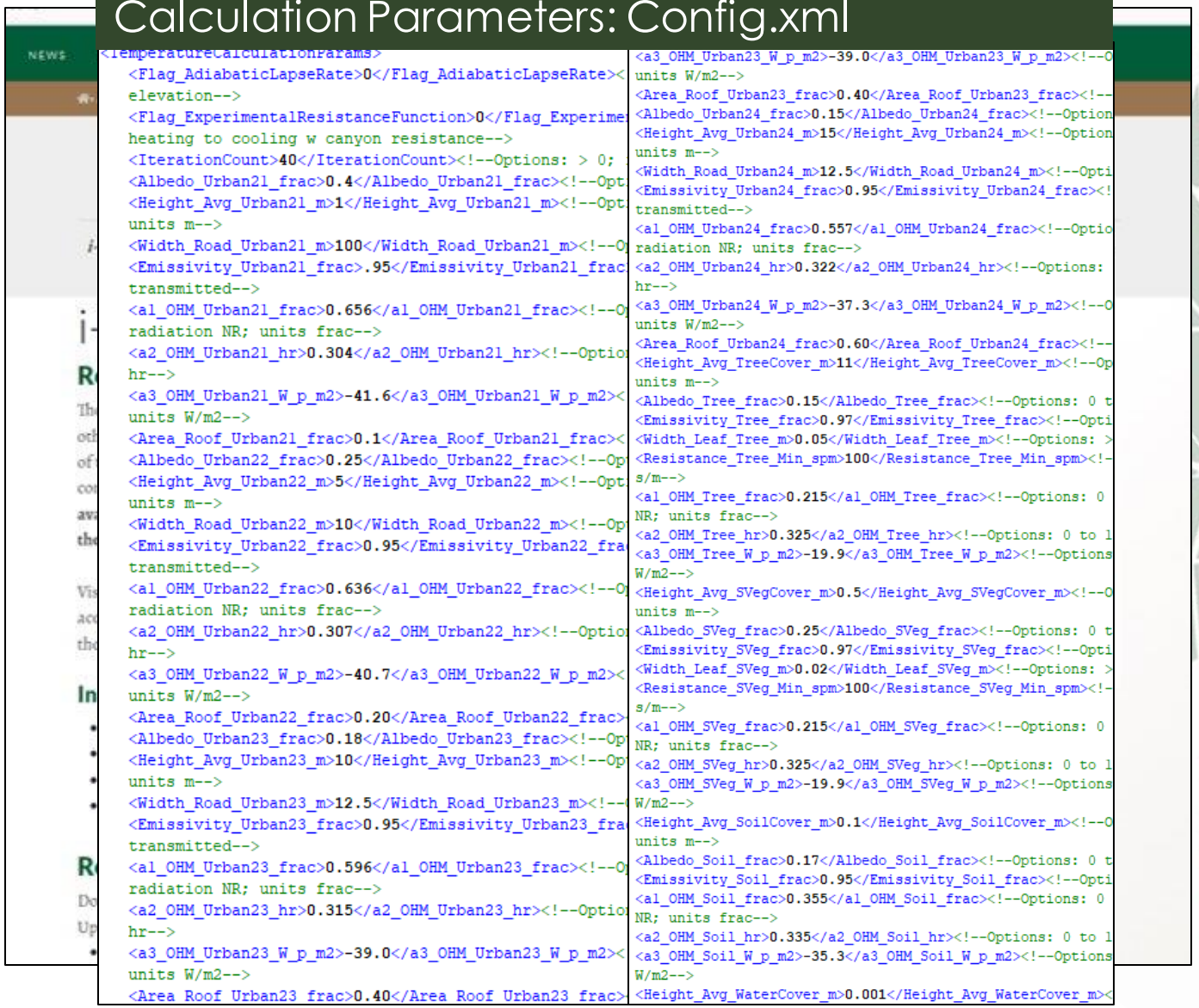
www.fia.fs.usda.gov/program-features/urban/

The Research Suite
i-Tree's science incubator

Actively in-development tools, available for use

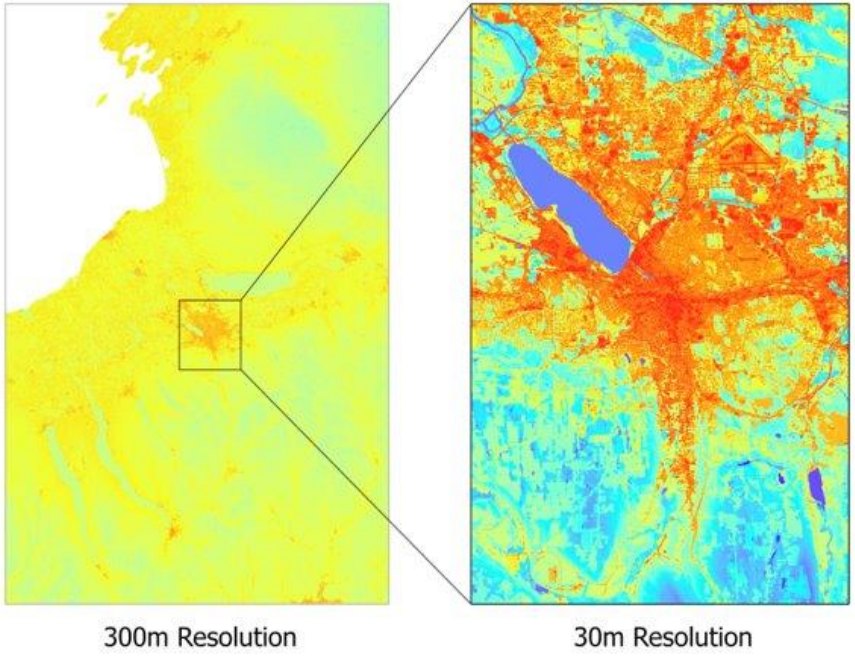
https://www.itreetools.org/tools/research-suite

Calculation Parameters: Config.xml



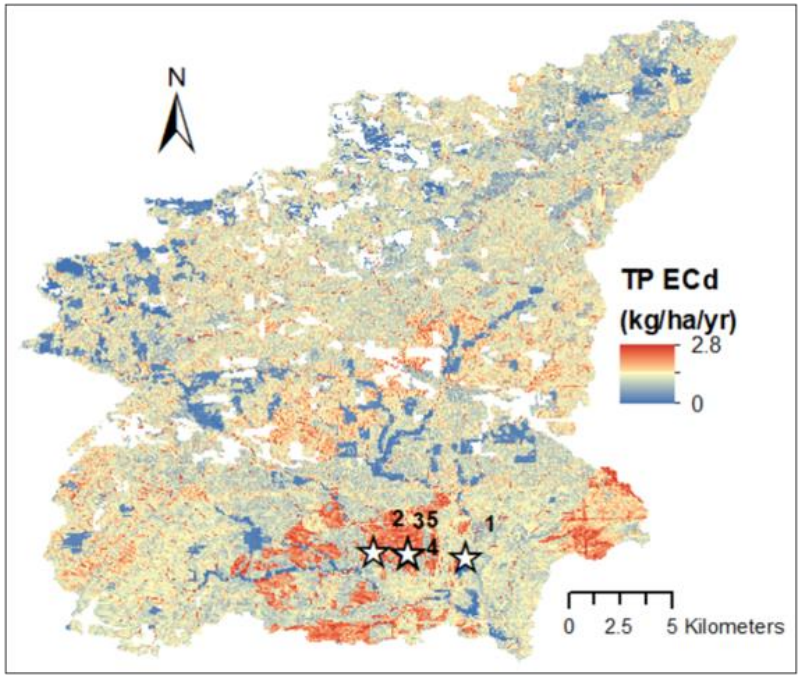
i-Tree Cool Air

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



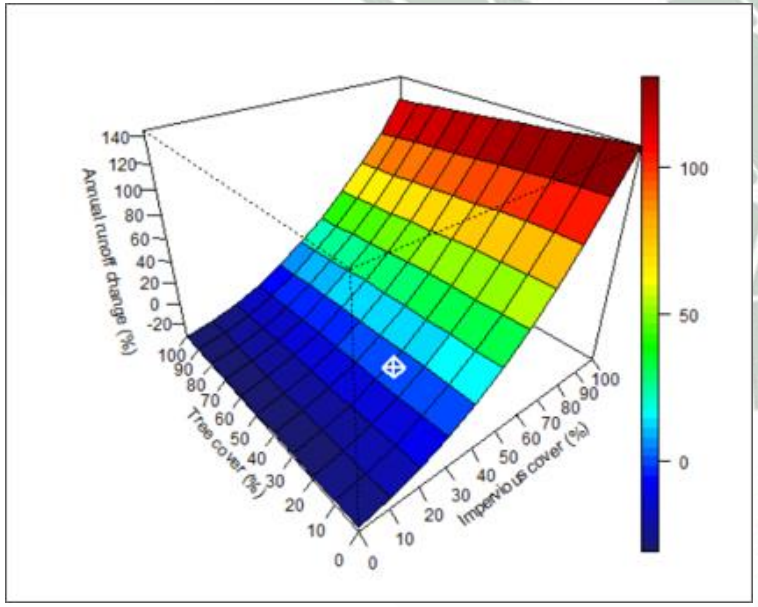
i-Tree Buffer

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

Mapping heat mitigation by tree cover in Naples, Italy

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

Taylor & Francis
Taylor & Francis Group

RESEARCH ARTICLE

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]

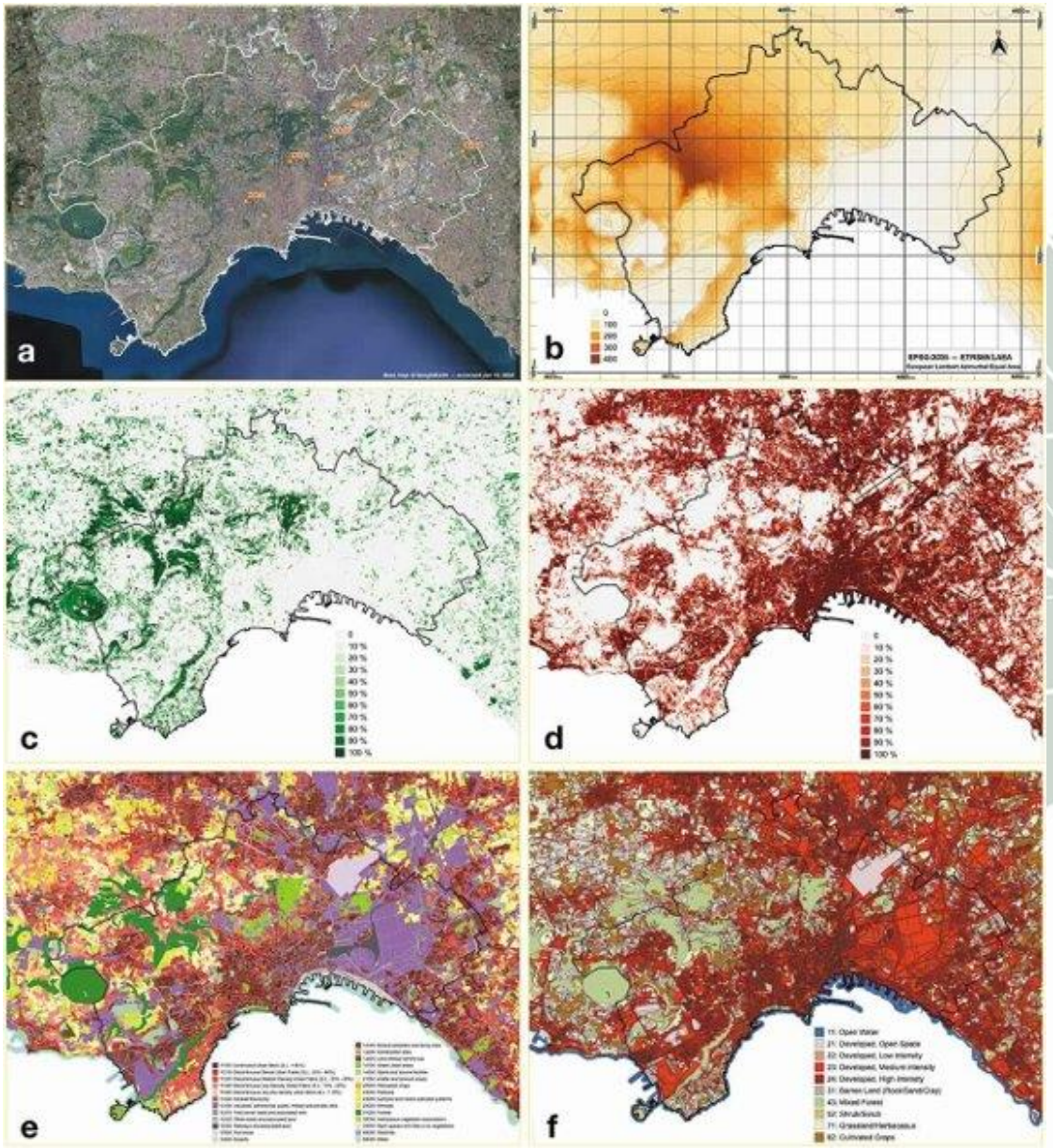
[a]Research Institute on Terrestrial Ecosystems (IRET), National Research Council (CNR), Porano, Italy; [b]Institute of Meteorology and Climate Research, Atmospheric Environmental Research (IMK-IFU), Karlsruhe Institute of Technology (KIT), Garmisch-Partenkirchen, Germany; [c]Department of Environmental 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
Revised 11 July 2022
Accepted 13 September 2022

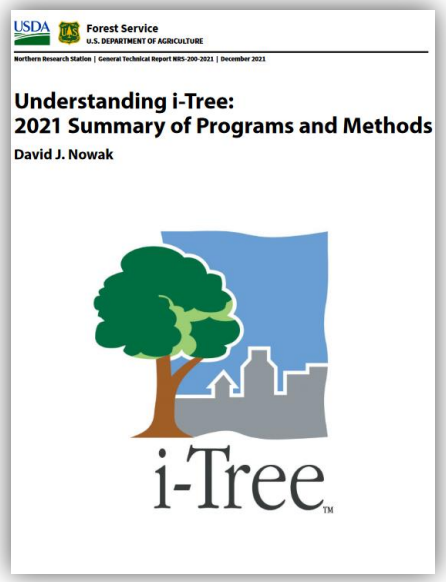
KEYWORDS
Heat waves; urban trees; temperature reduction; mediterranean city; Urban Atlas; ecosystem services



DOI: 10.1080/22797254.2022.2125833

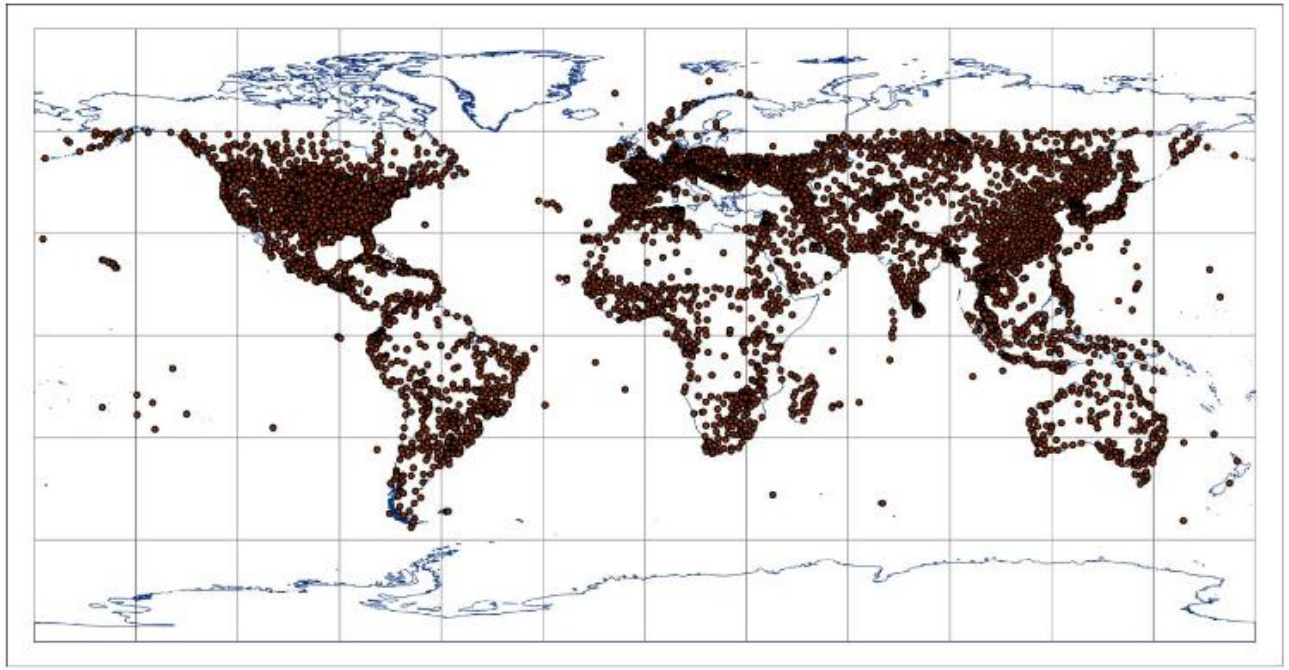
More recent science updates

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

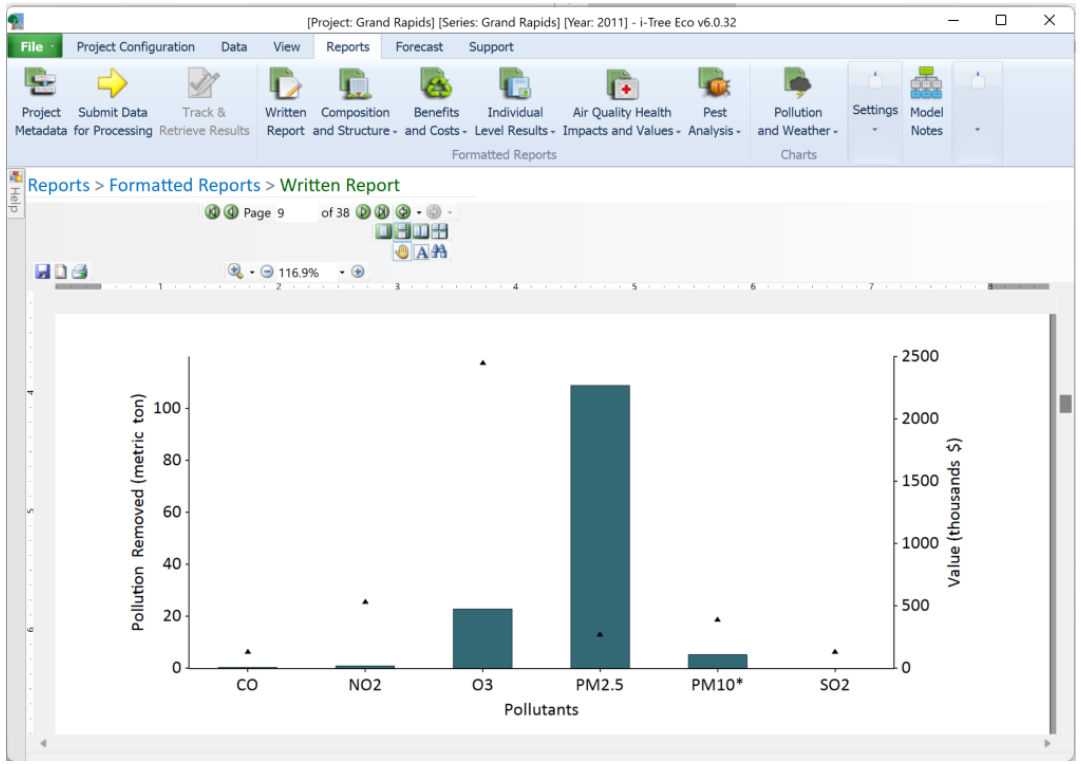


In development

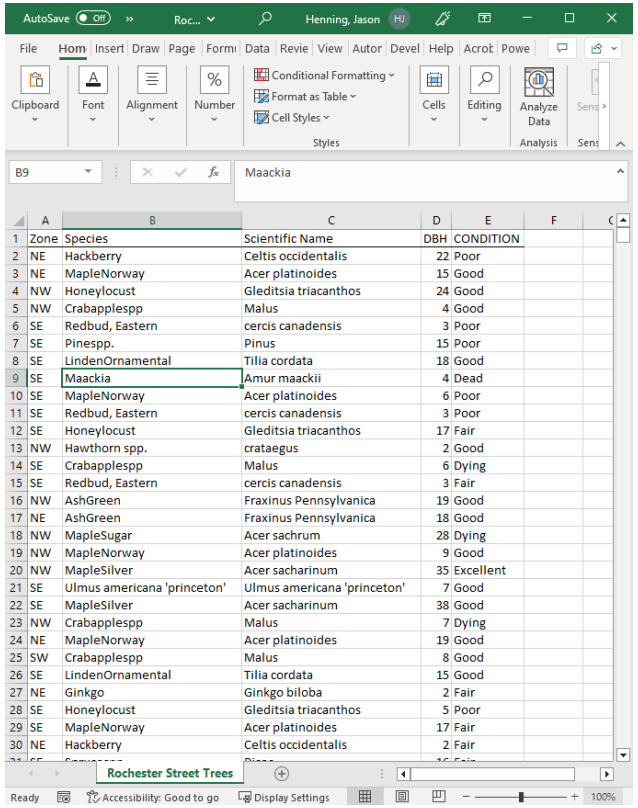
- Expanded weather data
- Wildlife model enhancement
- New tree cover and climate projections
- i-Tree Energy
- …and more



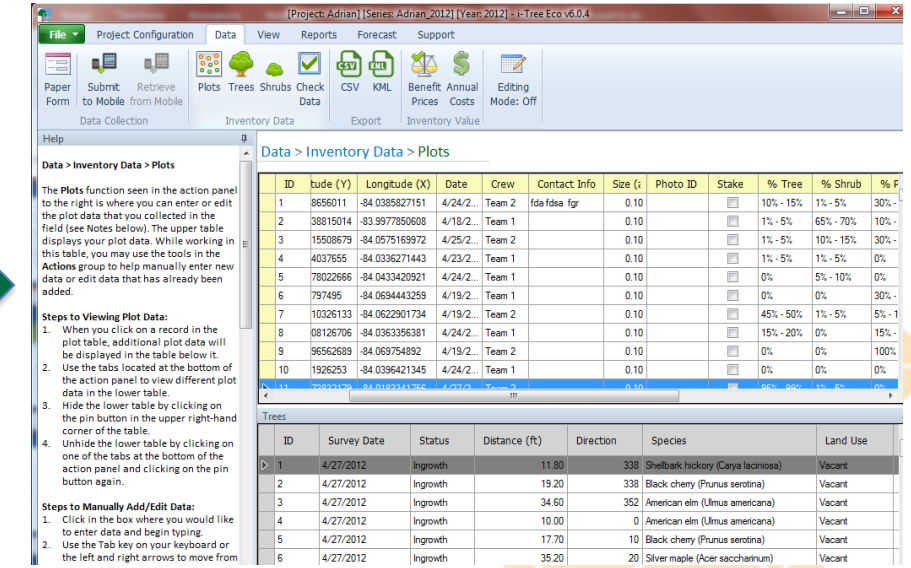
i-Tree is more than science



i-Tree Eco our flagship tool: Easy data import

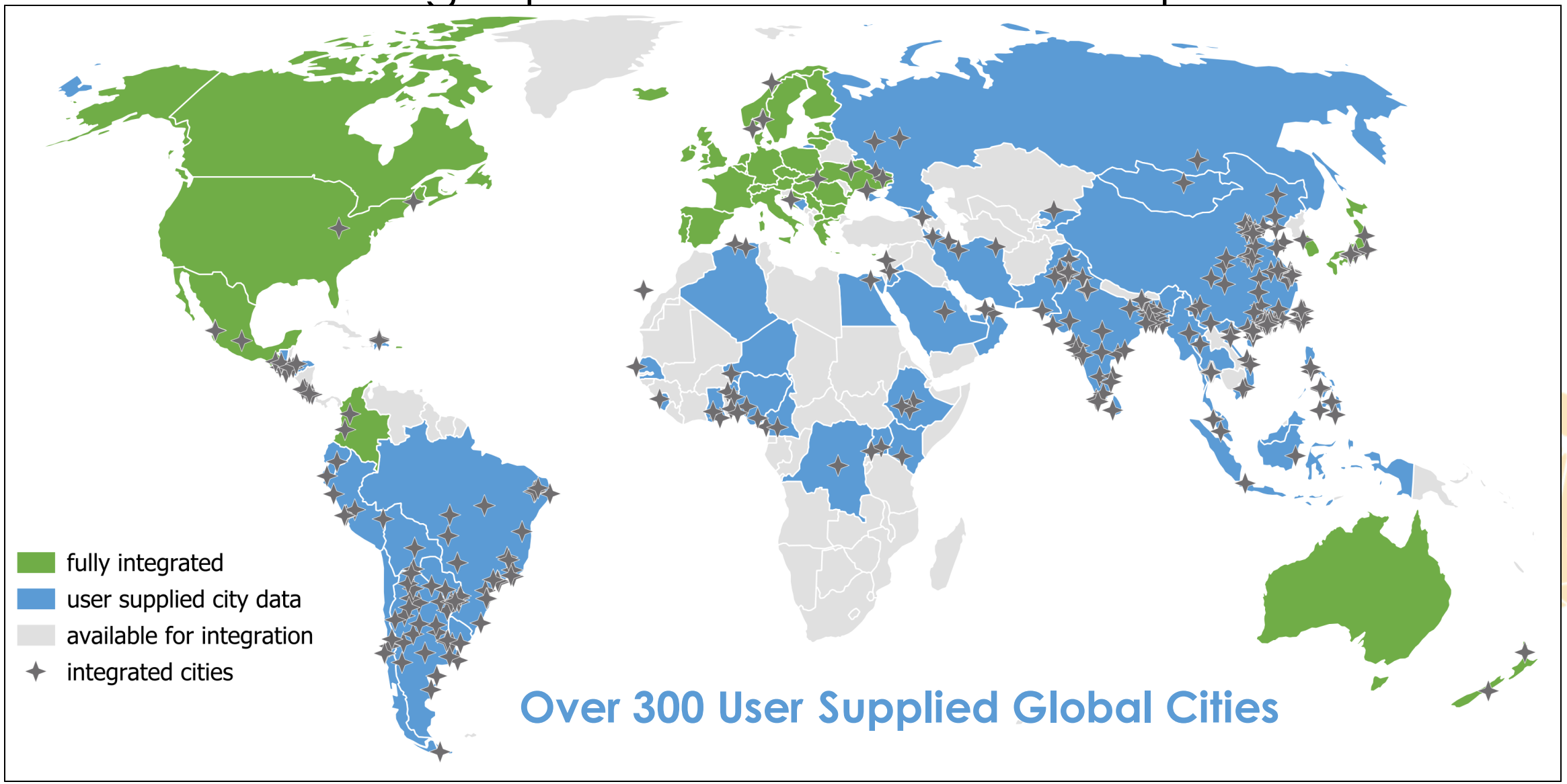


	A	B	C	D	E	F
1	Zone	Species	Scientific Name	DBH	CONDITION	
2	NE	Hackberry	Celtis occidentalis	22	Poor	
3	NE	MapleNorway	Acer platinoides	15	Good	
4	NW	Honeylocust	Gleditsia triacanthos	24	Good	
5	NW	Crabapplespp	Malus	4	Good	
6	SE	Redbud, Eastern	cercis canadensis	3	Poor	
7	SE	Pinespp.	Pinus	15	Poor	
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	Crabapplespp	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 sachrum	28	Dying	
19	NW	MapleNorway	Acer platinoides	9	Good	
20	NW	MapleSilver	Acer sacharinum	35	Excellent	
21	SE	Ulmus americana 'princeton'	Ulmus americana 'princeton'	7	Good	
22	SE	MapleSilver	Acer sacharinum	38	Good	
23	NW	Crabapplespp	Malus	7	Dying	
24	NE	MapleNorway	Acer platinoides	19	Good	
25	SW	Crabapplespp	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	



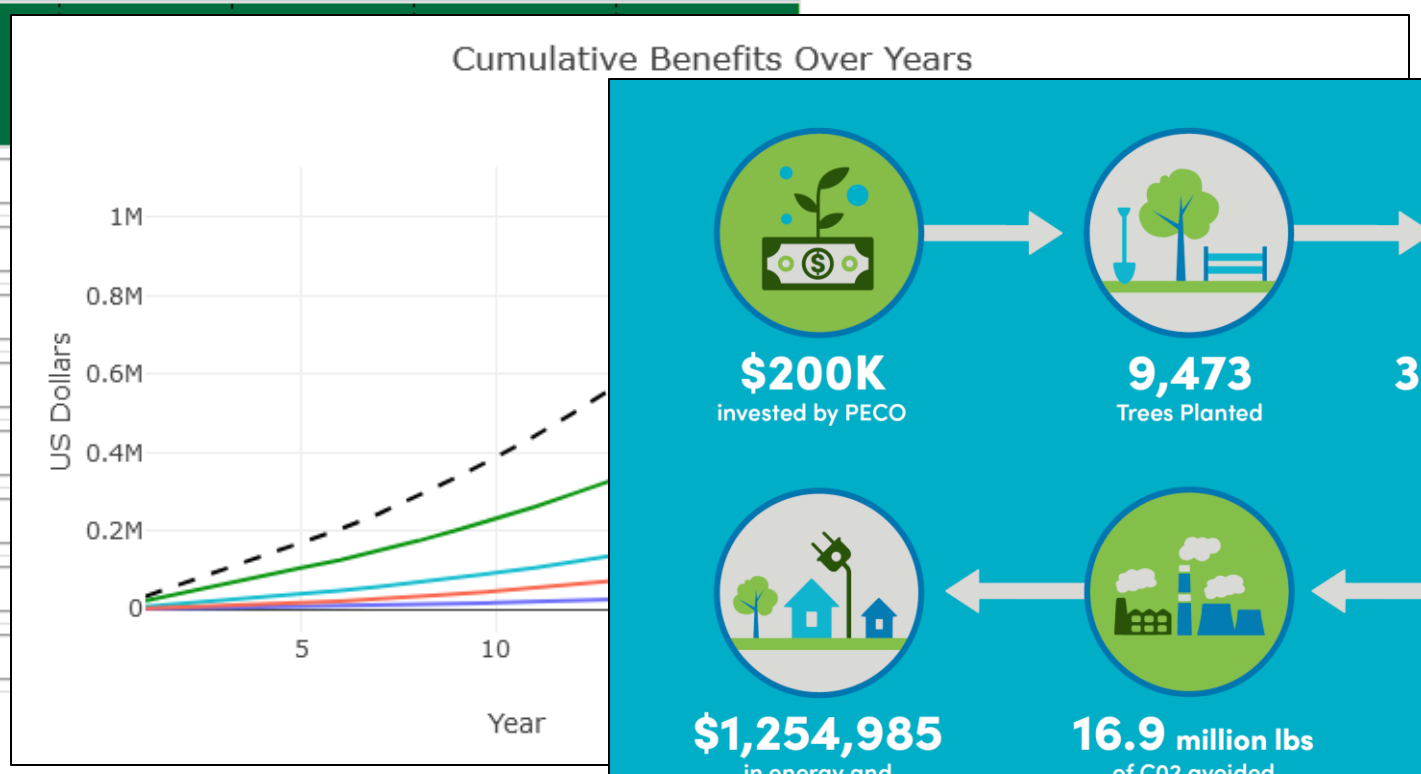
Up to 500,000 trees

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



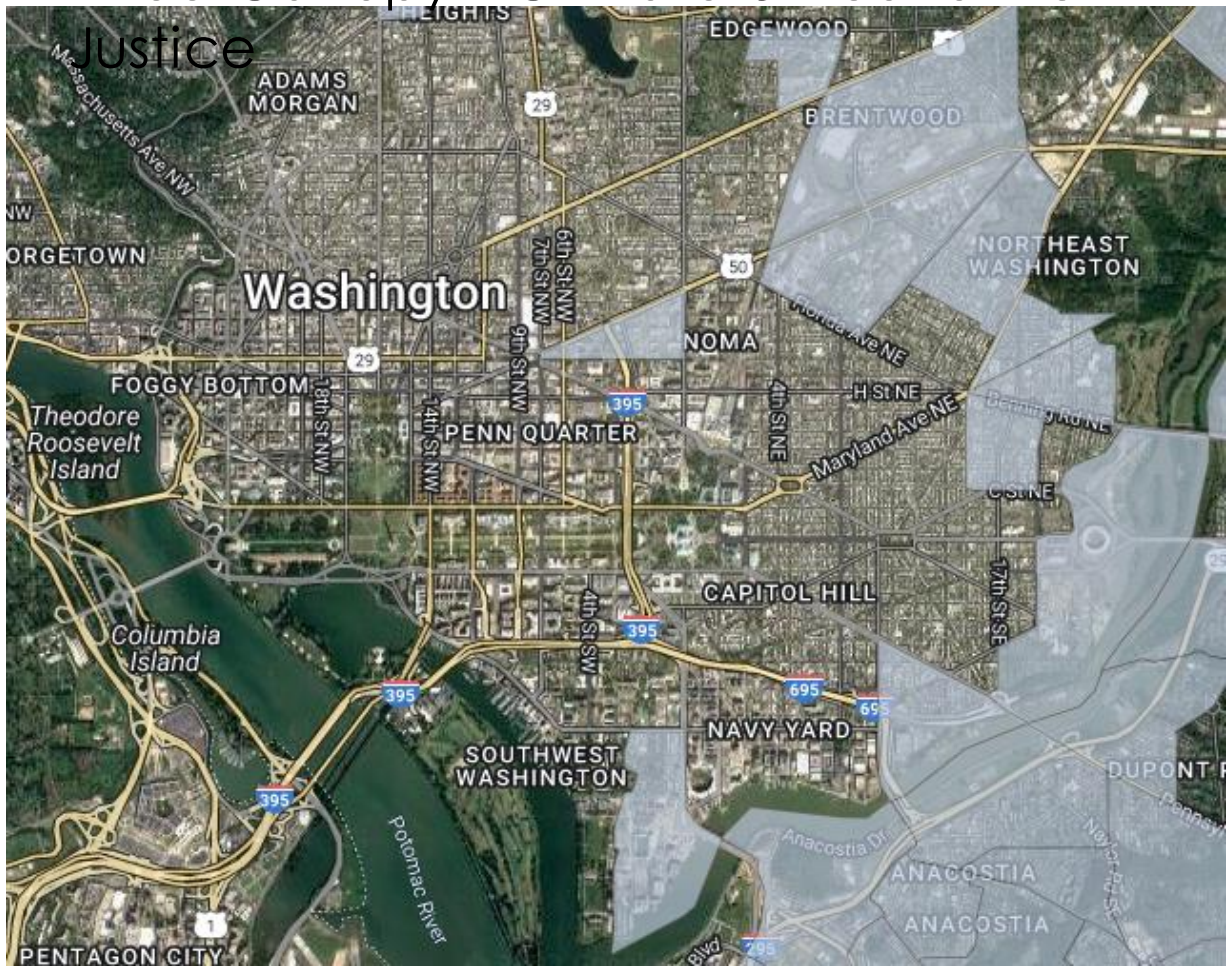
i-Tree Planting: Project benefits of 1,000's of trees

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	

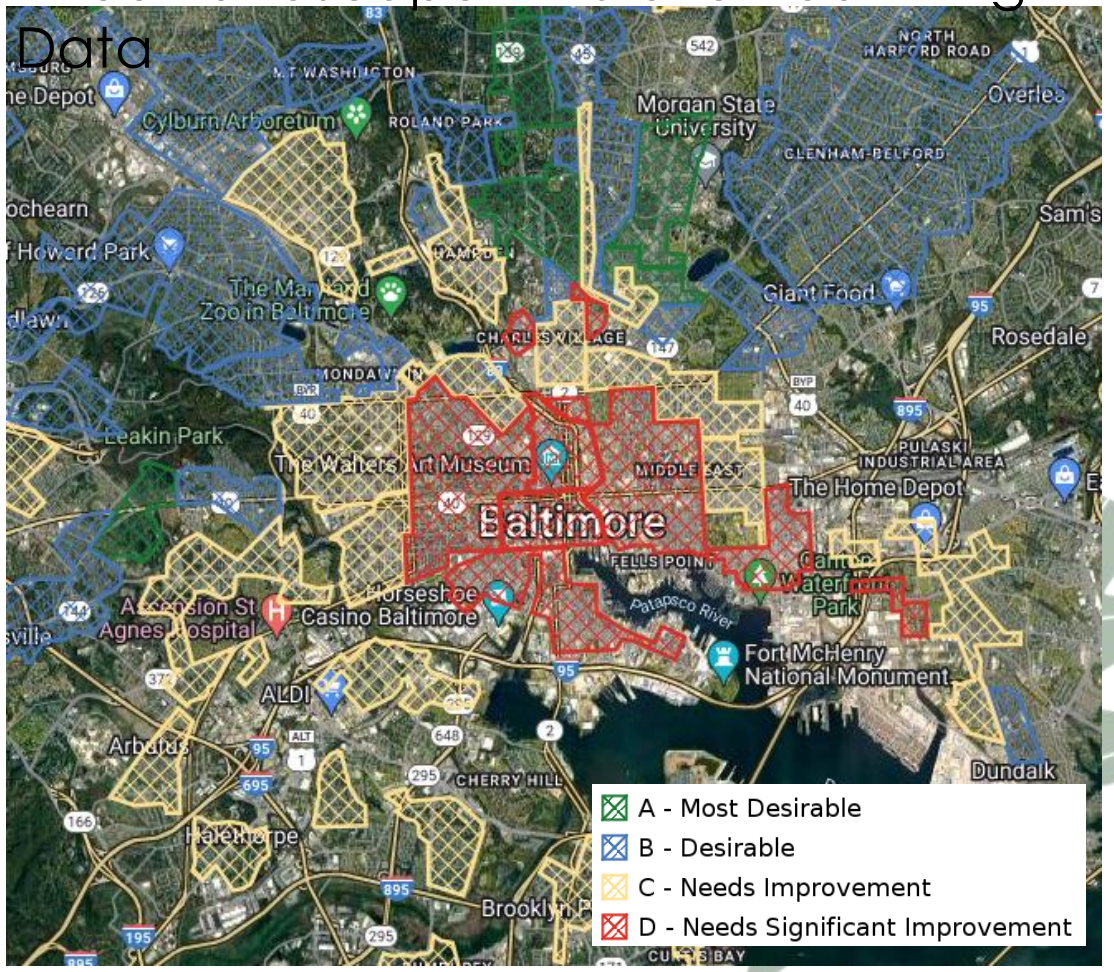


Easier to identify where tree benefits matter

i-Tree Canopy—Climate & Economic Justice

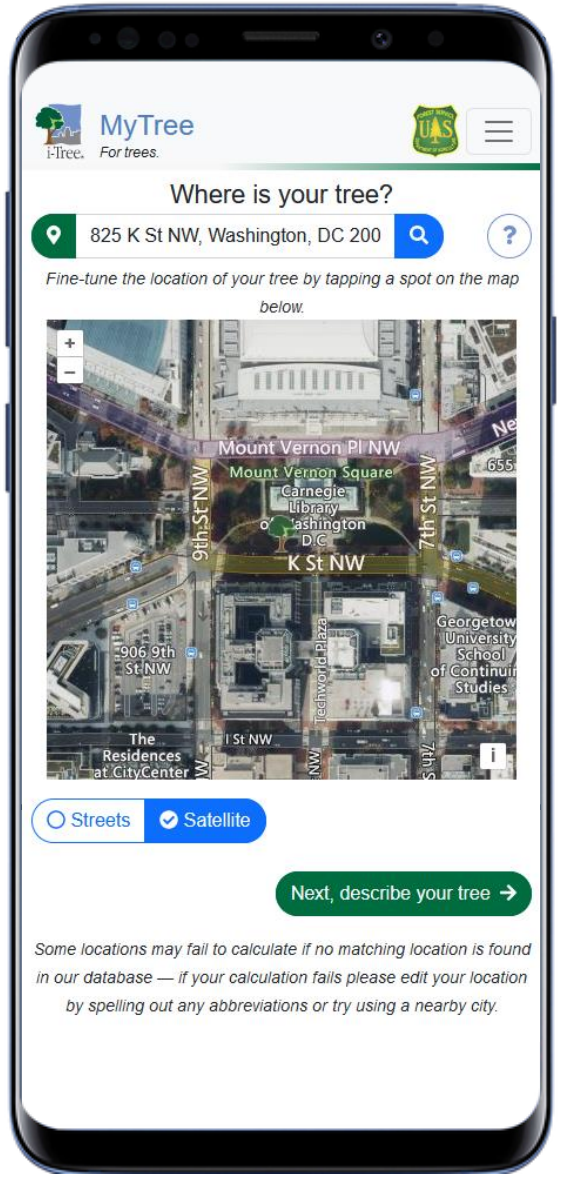


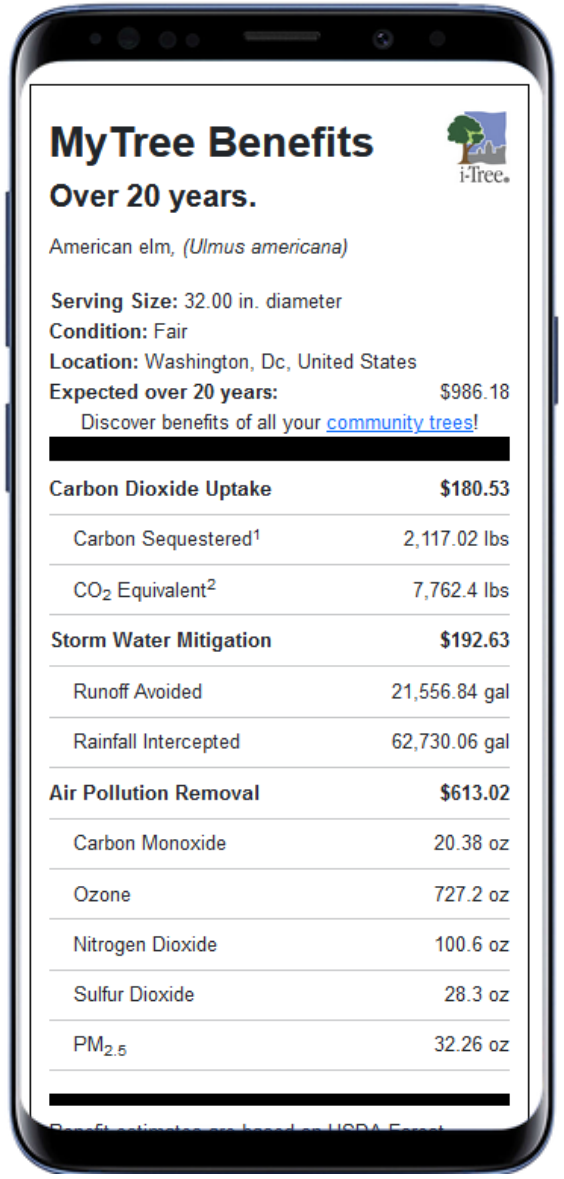
i-Tree Landscape—Historic Red-lining Data

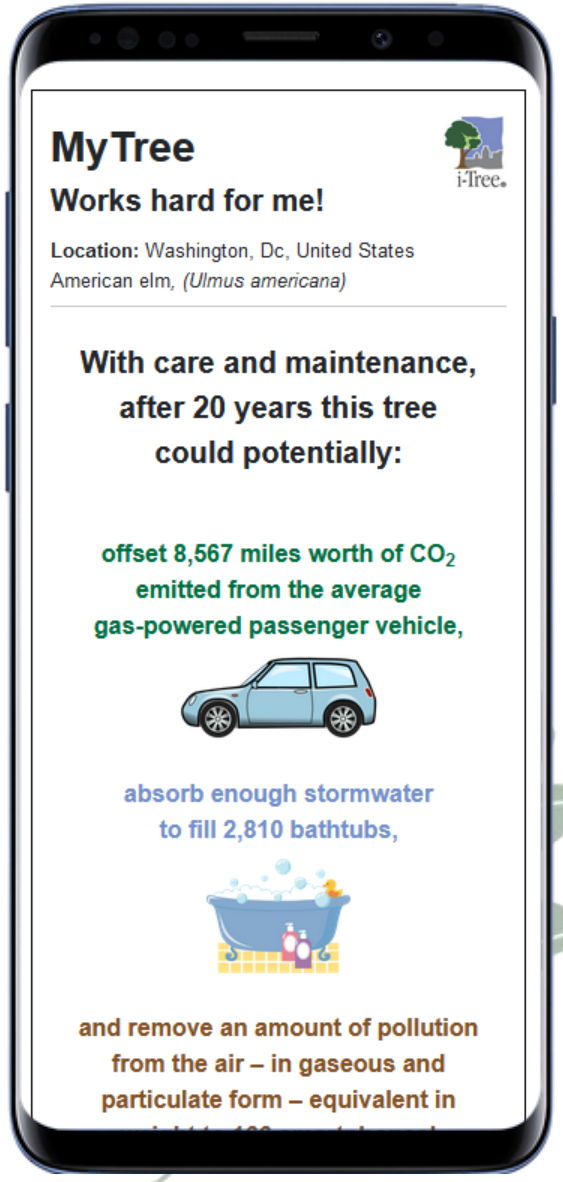


MyTree: i-Tree Science Everywhere

MyTree.itreetools.org

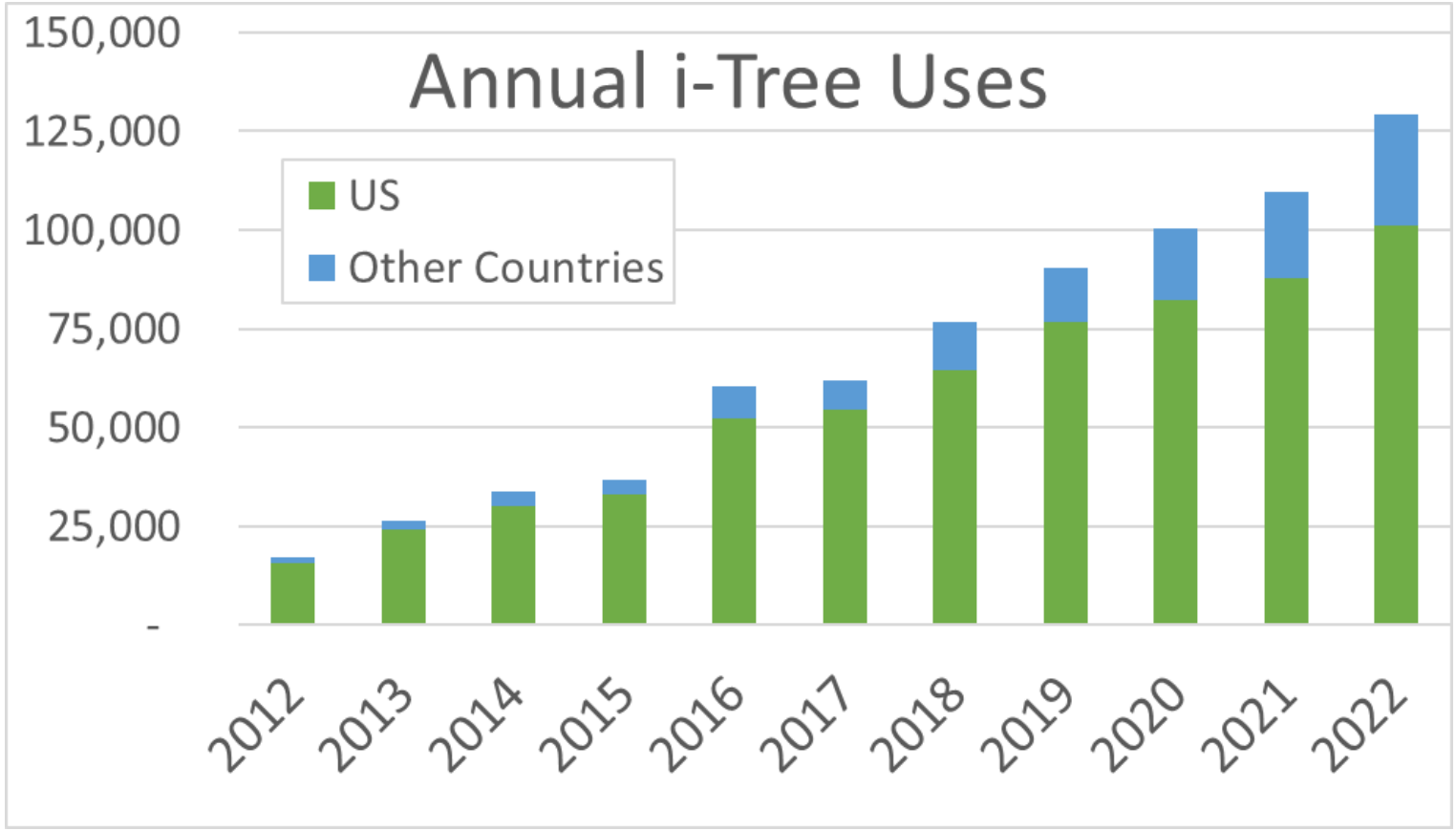






Supporting i-Tree Users

- i-Tree Open Academies (spring and summer sessions)
- i-Tree For Funding webinars
- i-Tree International Academy
- i-Tree Office Hours
- Over 1,000 individual technical support contacts each year



Check out what's new in i-Tree

www.itreetools.org

Connect with us

- i-Tree Day (Wednesday)
- Future i-Tree Academies
- Office Hours
- Connect on LinkedIn
- info@itreetools.org

Thank you

Jason Henning | The Davey Institute

www.itreetools.org

Jason.Henning@davey.com

i-Tree®

DAVEY Institute

Food and Agriculture Organization of the United Nations

Arbor Day Foundation

POLITECNICO MILANO 1863

CIEF

ISA

Smithsonian

2nd World Forum on Urban Forests

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

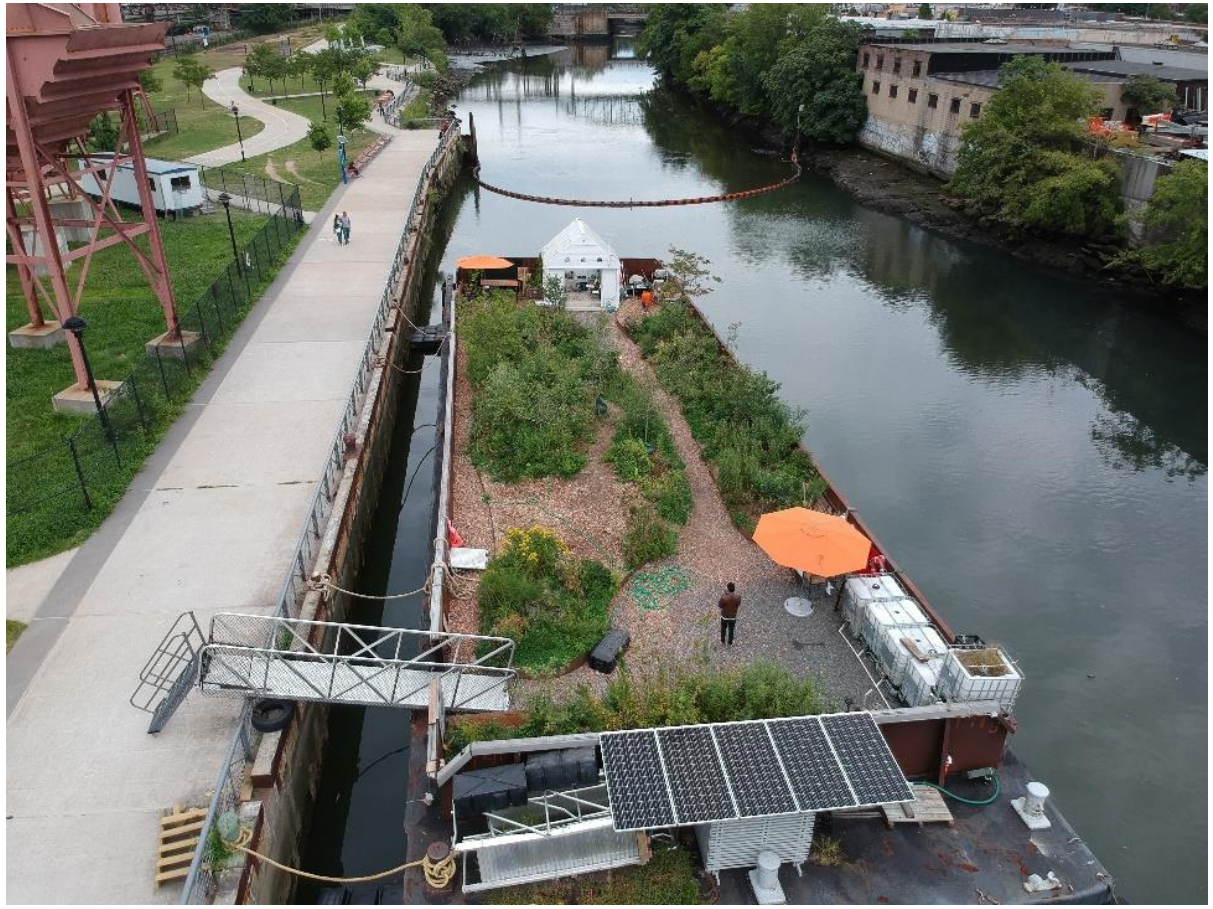
- UFS Arts programmatic data from 2016-2023, including:
  - Organizing team field notes
  - Group debriefs from quarterly UFS Arts all hands meetings
  - Artists' program evaluation assessments

- 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?*

Sensitizing us to the capacities of trees and forests

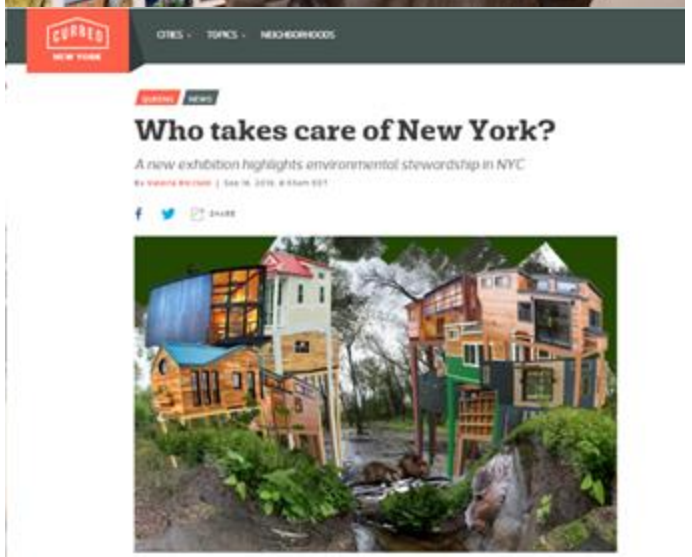
(Left to Right: *Tree Love* by Matthew López-Jensen; *Underground Sound Project* by Nikki Lindt)

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?

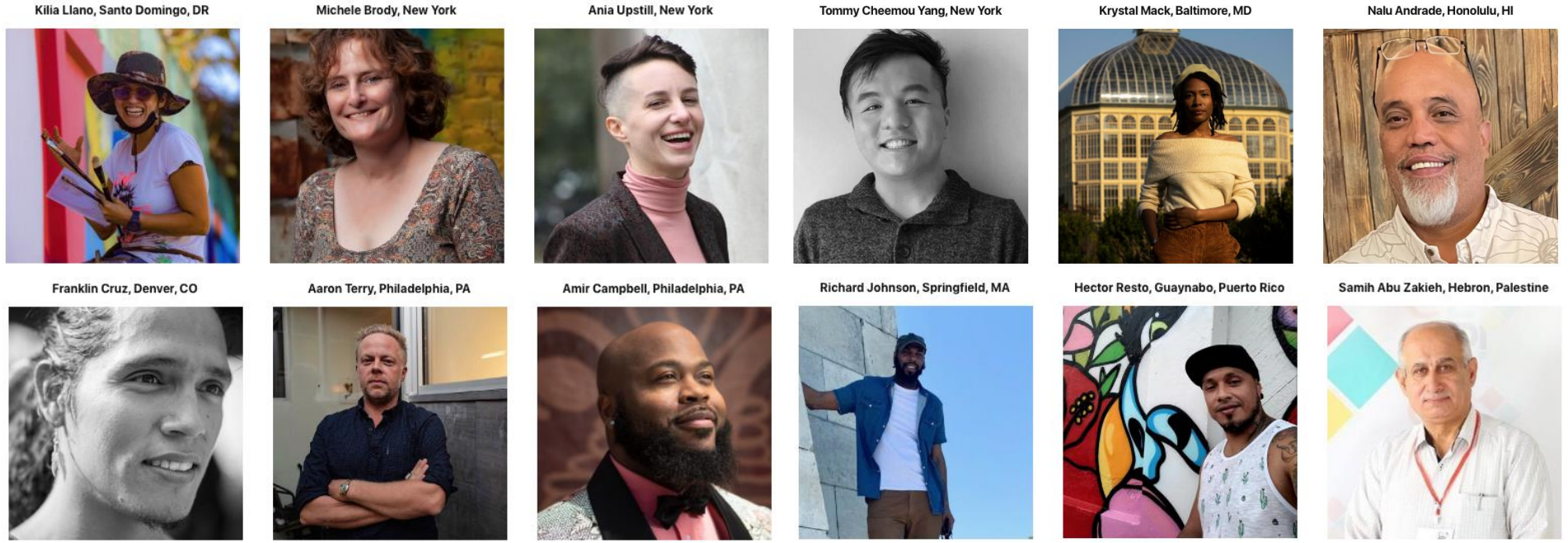
1. By posing new types of questions, art can create an opening for critical reflection in land management.

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.

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.



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

POLITECNICO MILANO 1863

ISA

Smithsonian

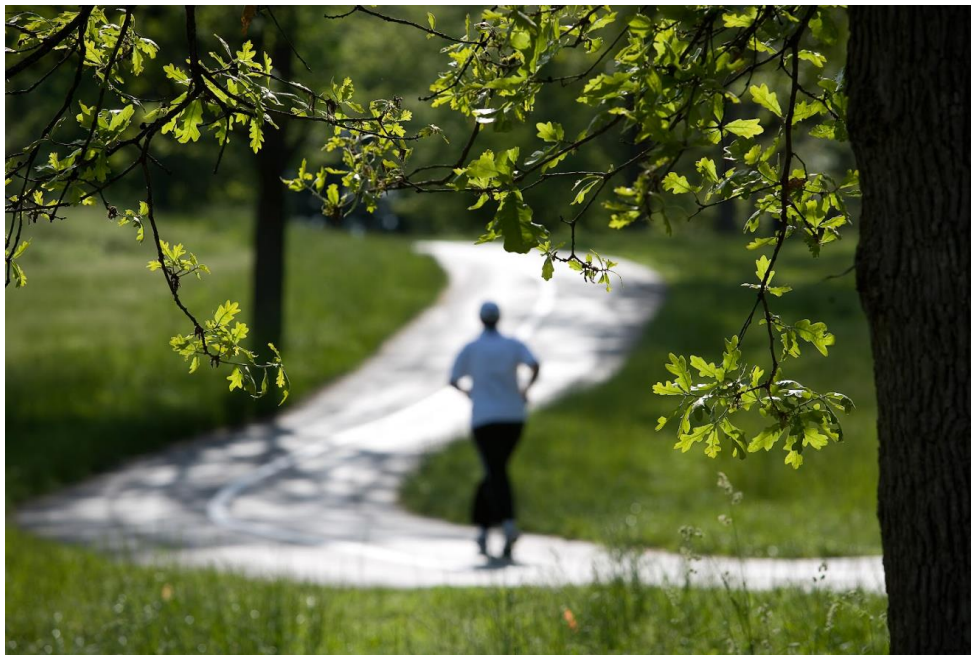
2nd World Forum on Urban Forests

2023

World Forum on Urban Forests

2nd World Forum on Urban Forests

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

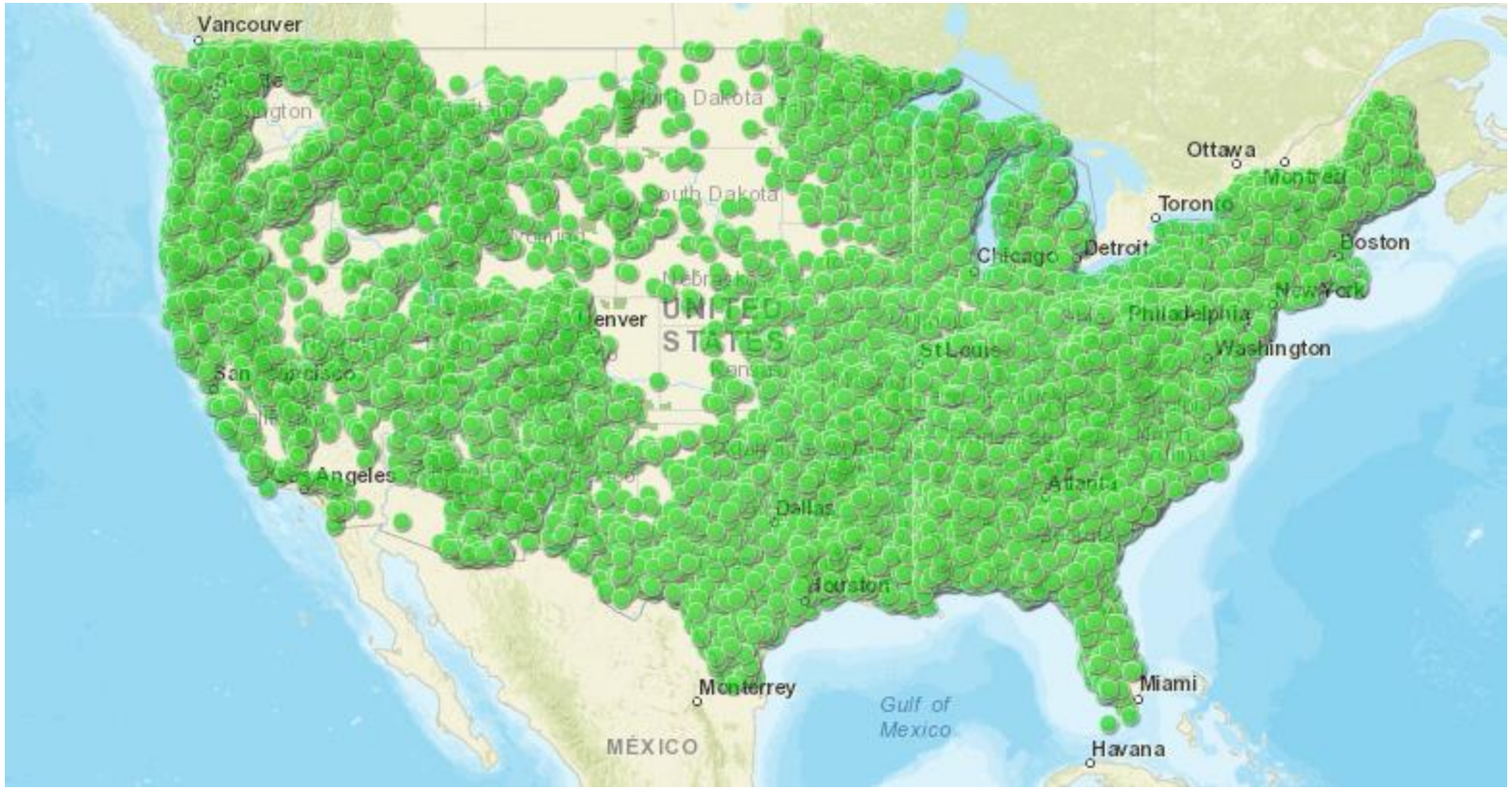
Nancy Sonti, USDA Forest Service, Baltimore Field Station

Rebekah Zehnder, Texas A&M Forest Service

U.S. Department of Agriculture
Forest Service

2nd World Forum on Urban Forests
Washington DC, 2023

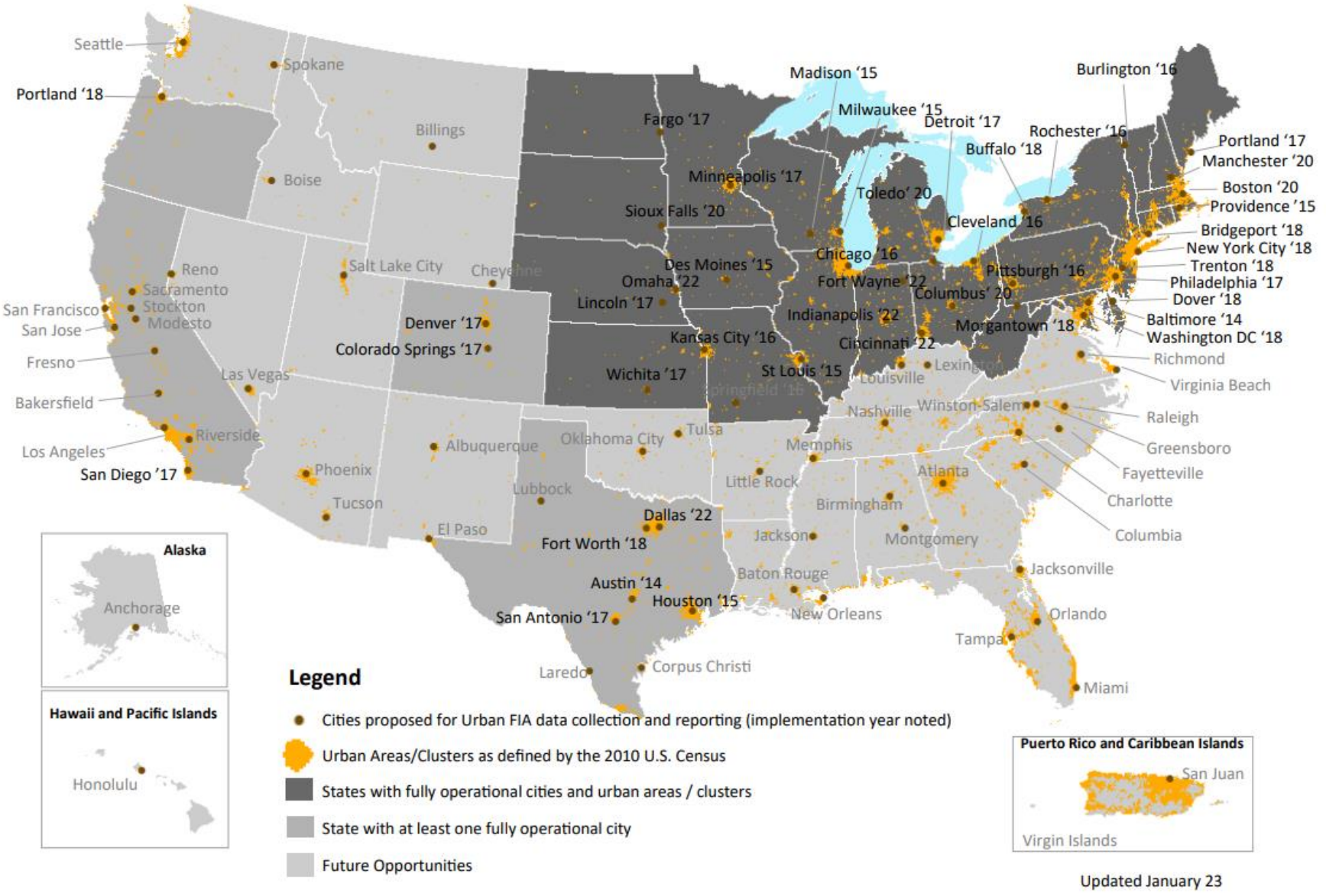
USDA Forest Service, Forest Inventory and Analysis (FIA) Program



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.

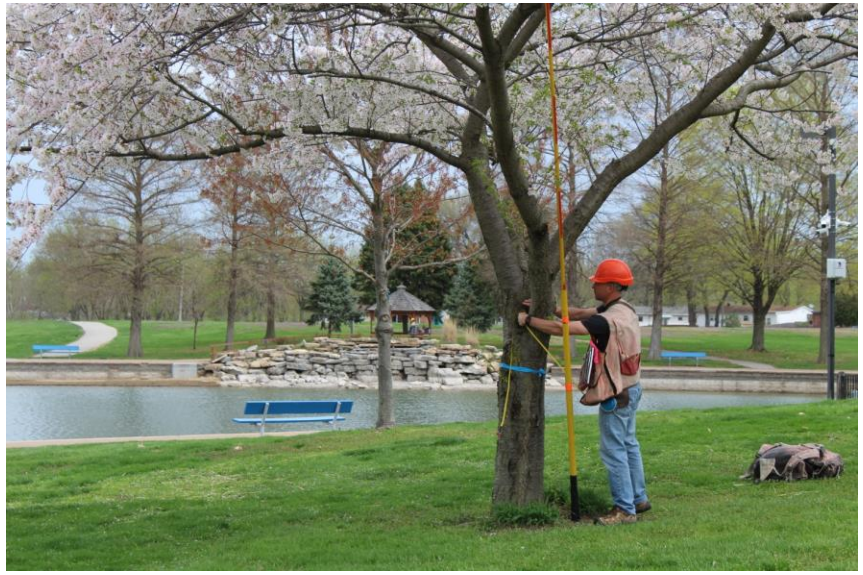
Urban FIA Program Goal

- **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.**



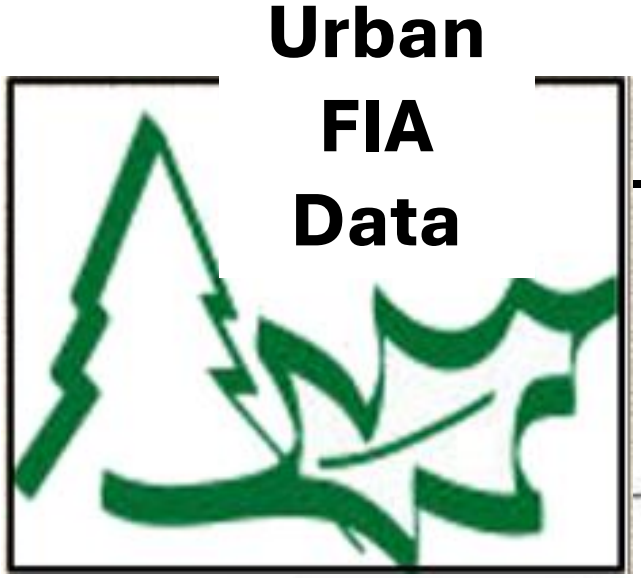
2nd World Forum on Urban Forests
Washington DC, 2023

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



Urban FIA Data

Location DB (City info)

Hourly Pollution Data

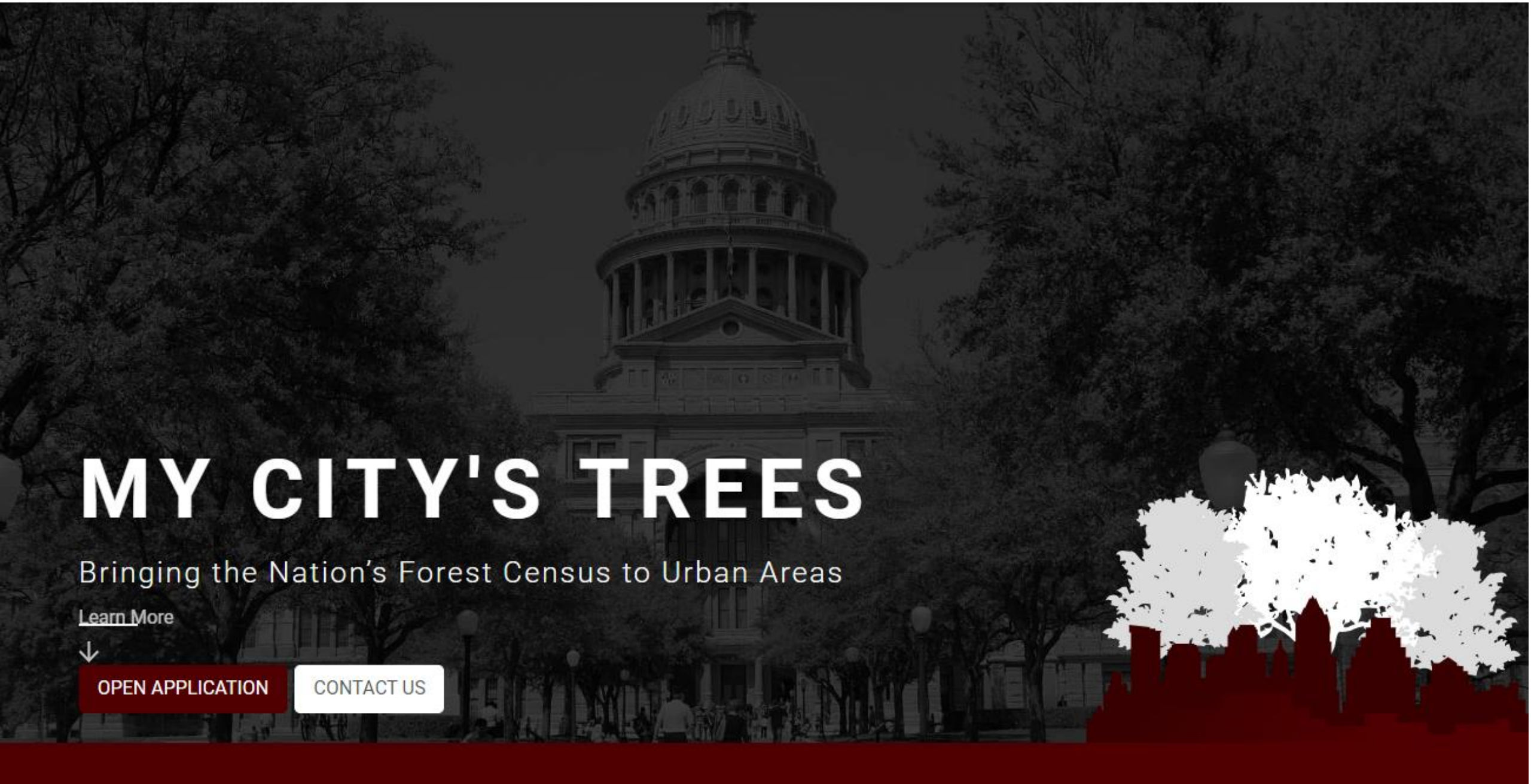
Hourly Weather Data

i-Tree Eco

- Carbon
- Air Quality
- Avoided Runoff
- Energy Effects
- Volatile Organic Compounds
- Structure
- Value

FIA Data Processing

- Certification
- Estimation
- Posting to public database



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

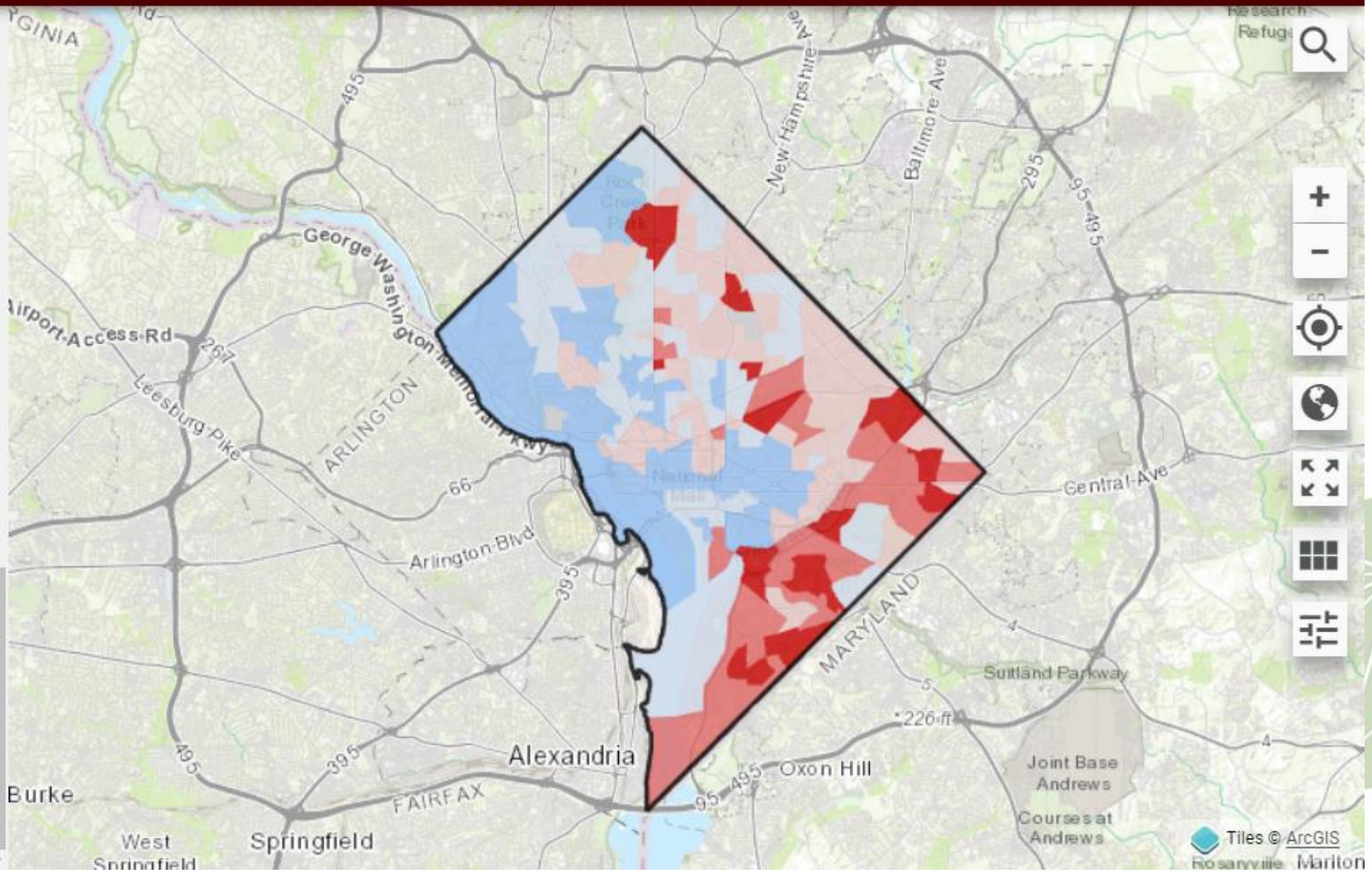
Population Density

Social Vulnerability

Heat Sensitivity-Exposure

Wards

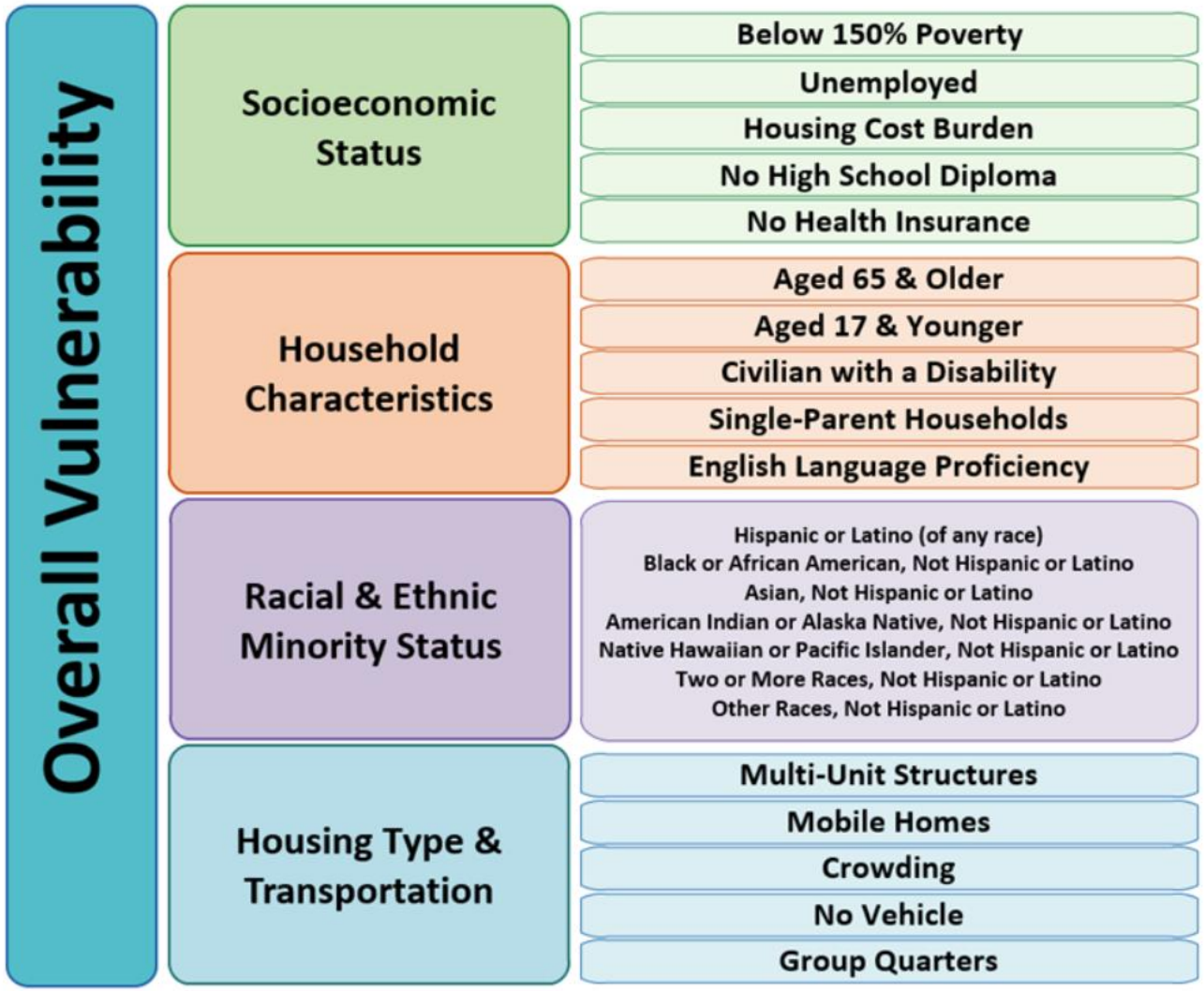
SELECT CLASSES



2nd World Forum on Urban Forests
Washington DC, 2023

Social Vulnerability Index (SVI)

Centers for Disease Control and Prevention (CDC)
Agency for Toxic Substances and Disease Registry (ATSDR)

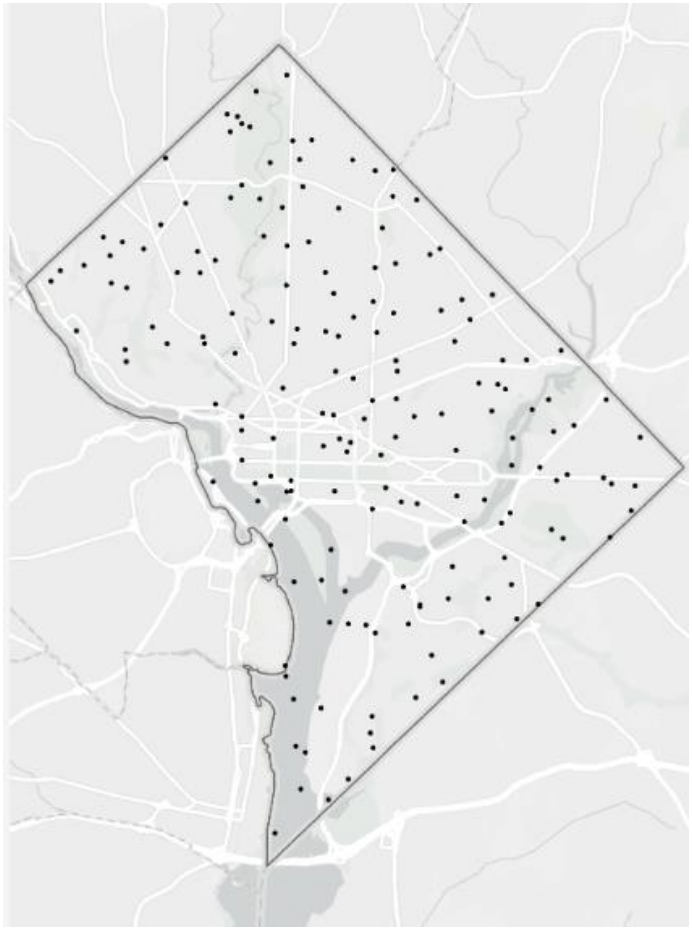


- **Developed to help public health officials and emergency response planners identify and map the communities that will most likely need support before, during, and after a hazardous event.**
- **Relative ranking of vulnerability based on 16 social factors from 2020 U.S. Census American Community Survey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

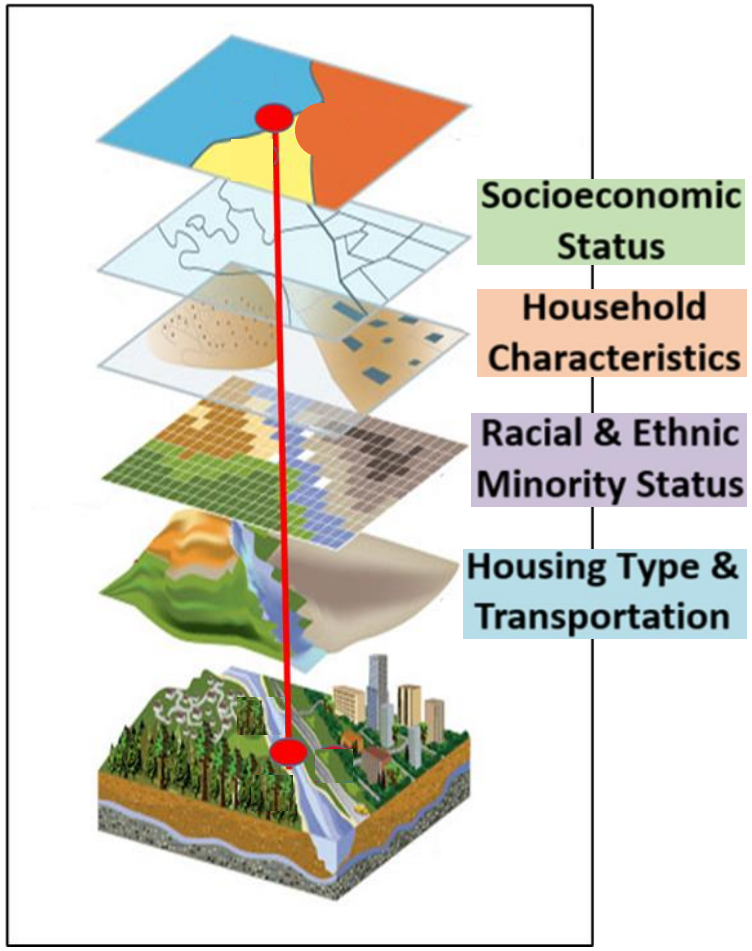
2nd World Forum on Urban Forests
Washington DC, 2023

Attaching SVI Data to Urban FIA Plots

Urban FIA plots in Washington, DC

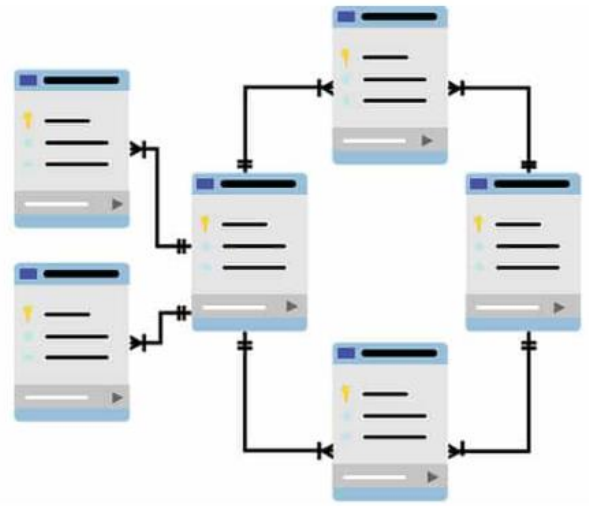


Plots are labeled with census tract SVI data



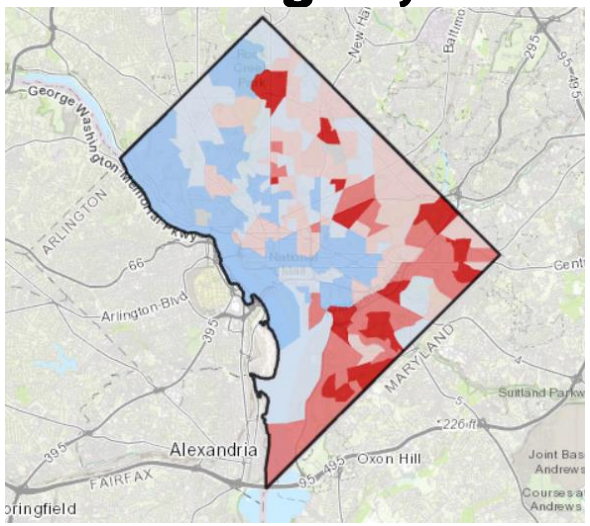
SVI available as an analysis variable

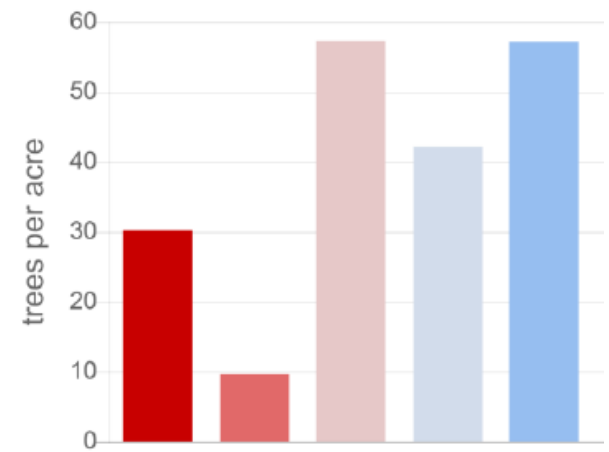
PE_CN	EVAL_ID	PLT_CN	SVI_Theme1	SVI_Theme2	SVI_Theme3	SVI_Theme4
1.27309E+15	Washington2021Curr	508333366126144	0.94	0.94	0.94	0.94
1.27309E+15	Washington2021Curr	508333372126144	0.90	0.90	0.90	0.90
1.27309E+15	Washington2021Curr	508333372126144	0.90	0.90	0.90	0.90
1.27309E+15	Washington2021Curr	508333372126144	0.90	0.90	0.90	0.90
1.27309E+15	Washington2021Curr	508333372126144	0.61	0.61	0.61	0.61
1.27309E+15	Washington2021Curr	508333372126144	0.61	0.61	0.61	0.61
1.27309E+15	Washington2021Curr	508333372126144	0.61	0.61	0.61	0.61
1.27309E+15	Washington2021Curr	508333372126144	0.61	0.61	0.61	0.61
1.27309E+15	Washington2021Curr	508333375126144	0.61	0.61	0.61	0.61
1.27309E+15	Washington2021Curr	508333375126144	0.61	0.61	0.61	0.61
1.27309E+15	Washington2021Curr	508333375126144	0.49	0.49	0.49	0.49
1.27309E+15	Washington2021Curr	508333375126144	0.45	0.45	0.45	0.45
1.27309E+15	Washington2021Curr	508333375126144	0.41	0.41	0.41	0.41
1.27309E+15	Washington2021Curr	508333375126144	0.36	0.36	0.36	0.36
1.27309E+15	Washington2021Curr	508333375126144	0.32	0.32	0.32	0.32
1.27309E+15	Washington2021Curr	508333375126144	0.27	0.27	0.27	0.27
1.27309E+15	Washington2021Curr	508333375126144	0.23	0.23	0.23	0.23
1.27309E+15	Washington2021Curr	508333377126144	0.19	0.19	0.19	0.19
1.27309E+15	Washington2021Curr	508333377126144	0.14	0.14	0.14	0.14
1.27309E+15	Washington2021Curr	508333382126144	0.10	0.10	0.10	0.10
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
1.27309E+15	Washington2021Curr	508333384126144	-0.03	-0.03	-0.03	-0.03
1.27309E+15	Washington2021Curr	508333384126144	-0.07	-0.07	-0.07	-0.07



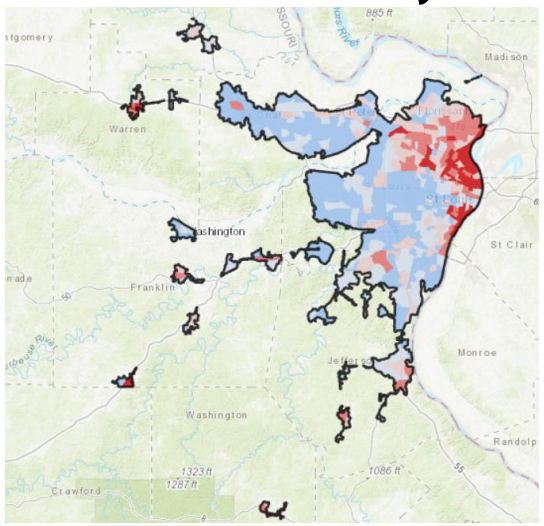
Tree Density by Social Vulnerability

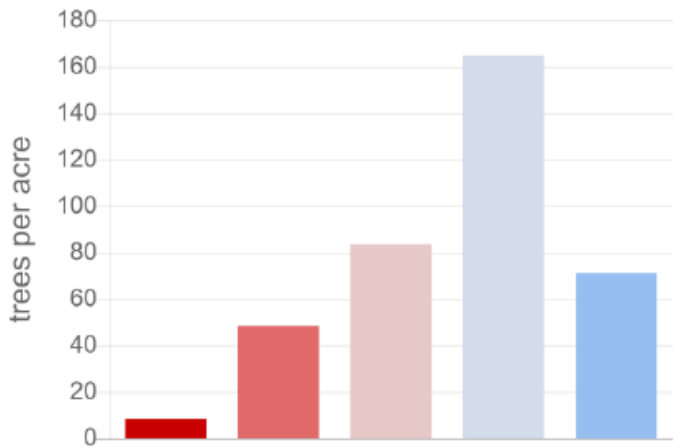
Washington, DC



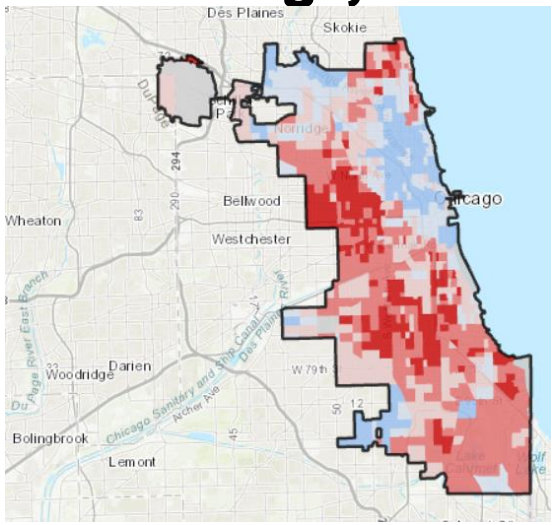


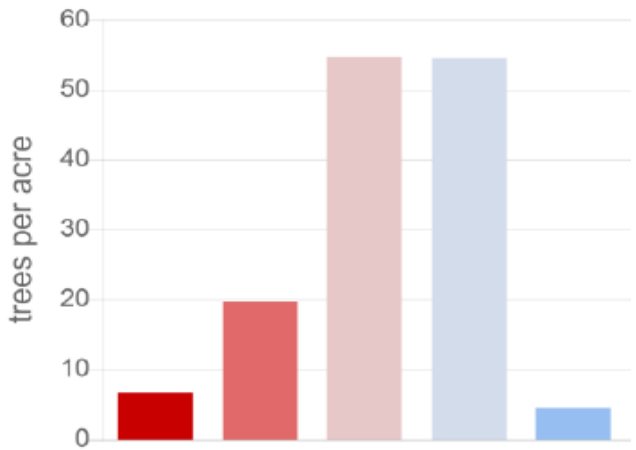
Greater St. Louis, MO



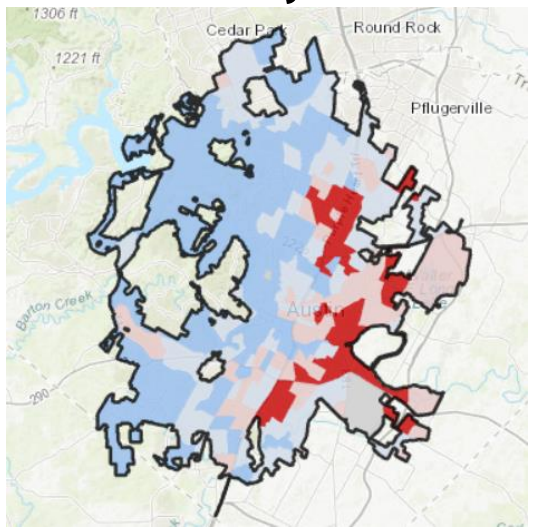


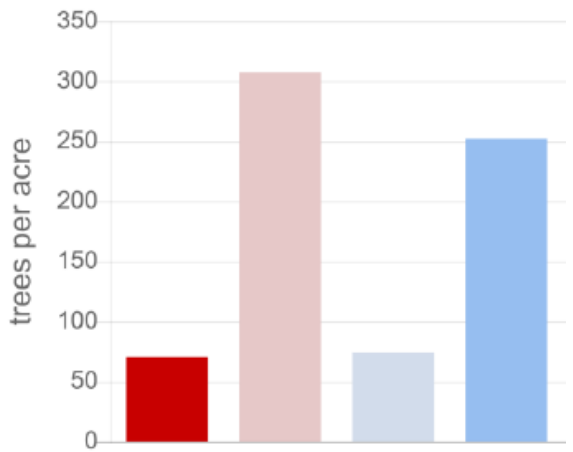
Chicago, IL





Austin, TX





Social Vulnerability high to low →

Select Ecosystem Services by Social Vulnerability

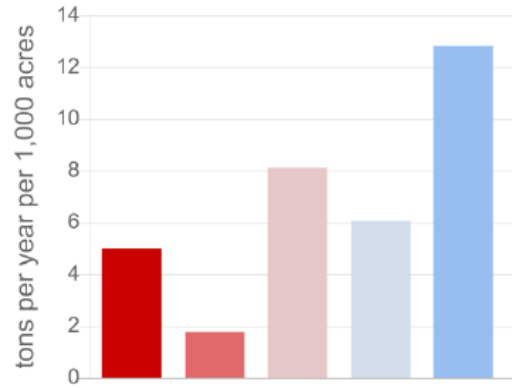
Washington, DC

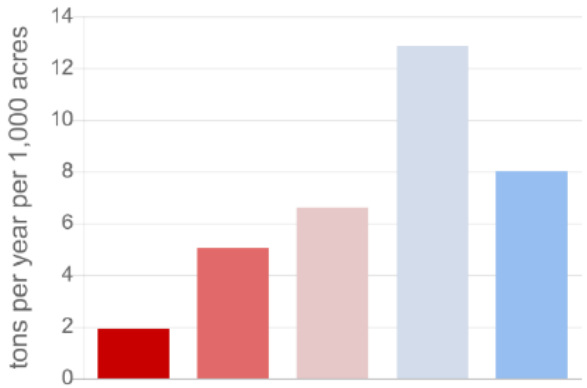
Greater St. Louis, MO

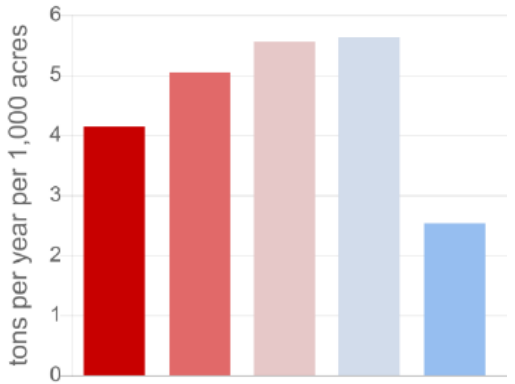
Chicago, IL

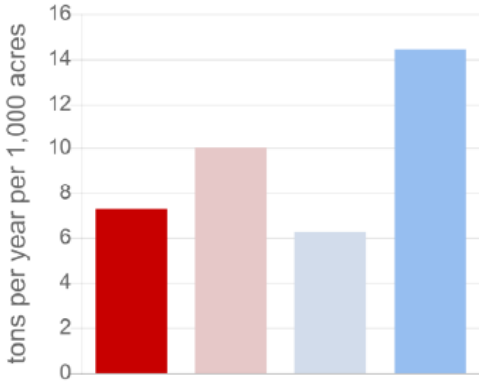
Austin, TX

Pollution Removal (tons per 1000 acres)

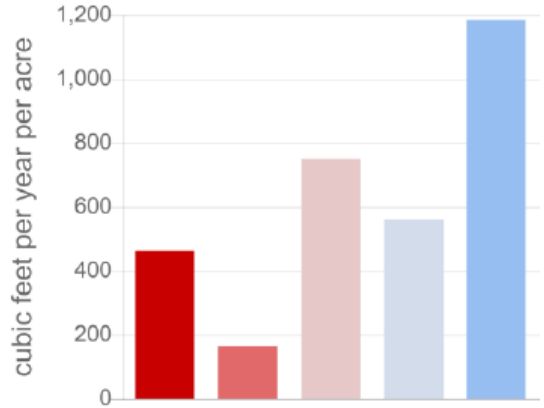


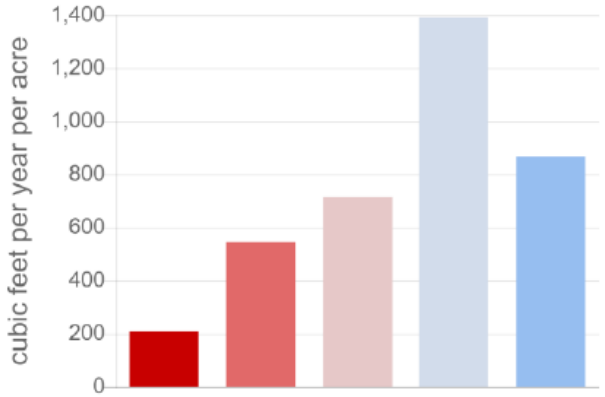


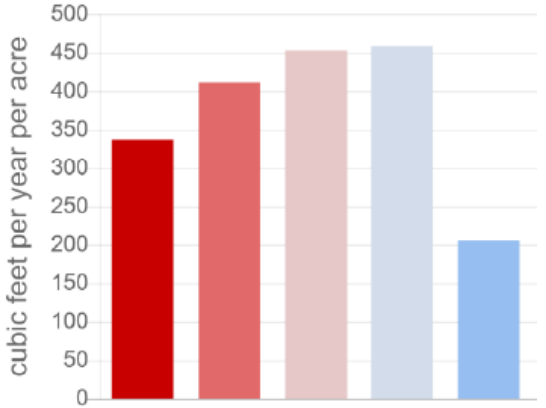


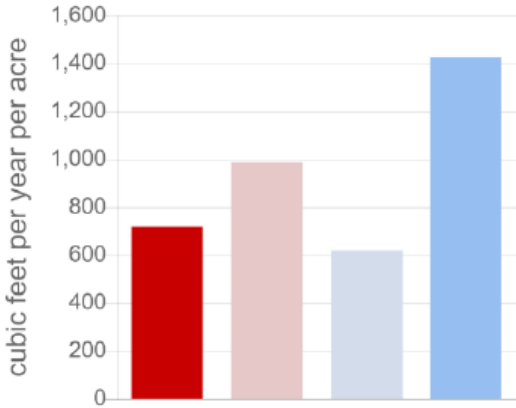


Avoided Runoff (cu ft/year per acre)

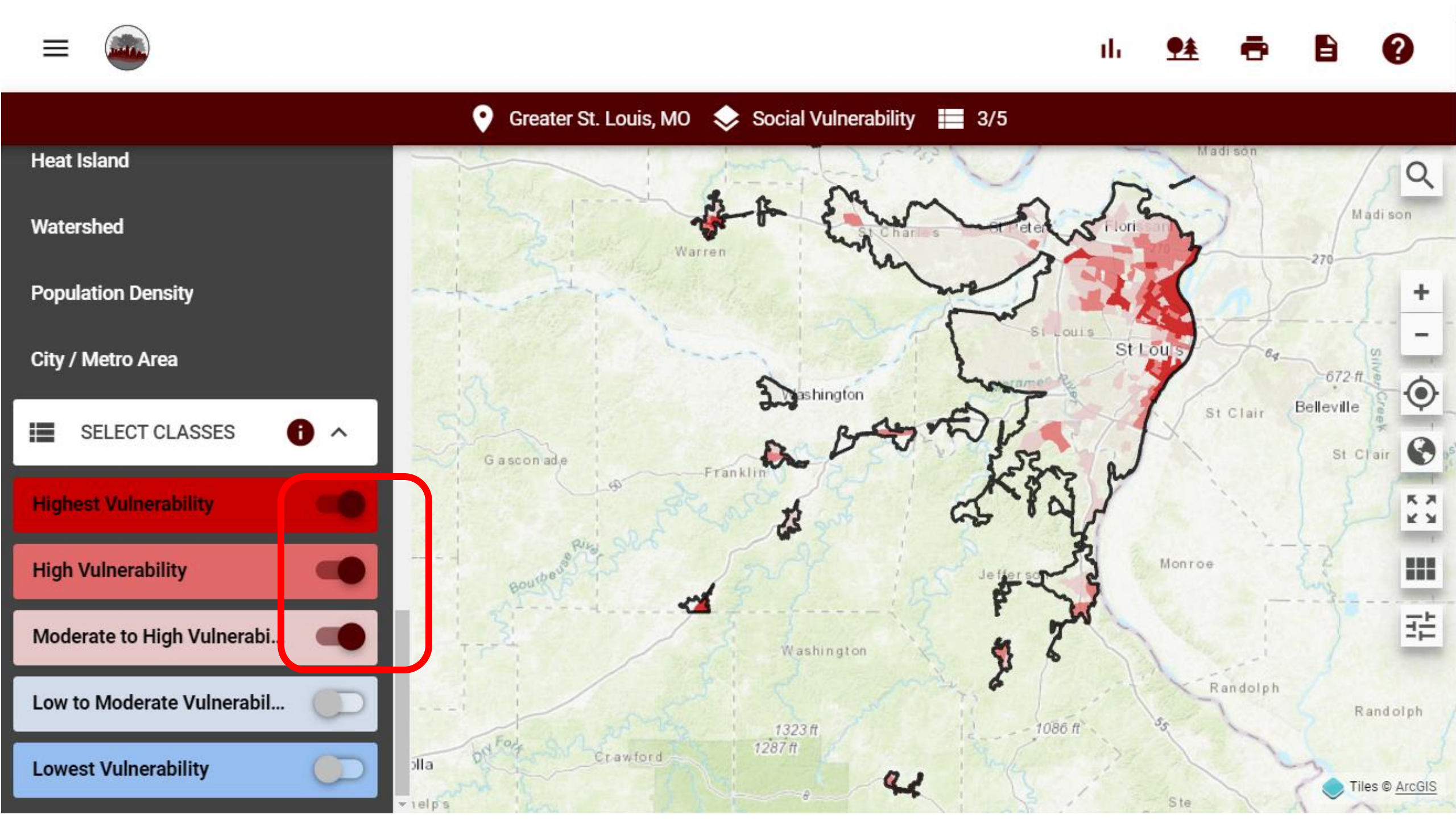


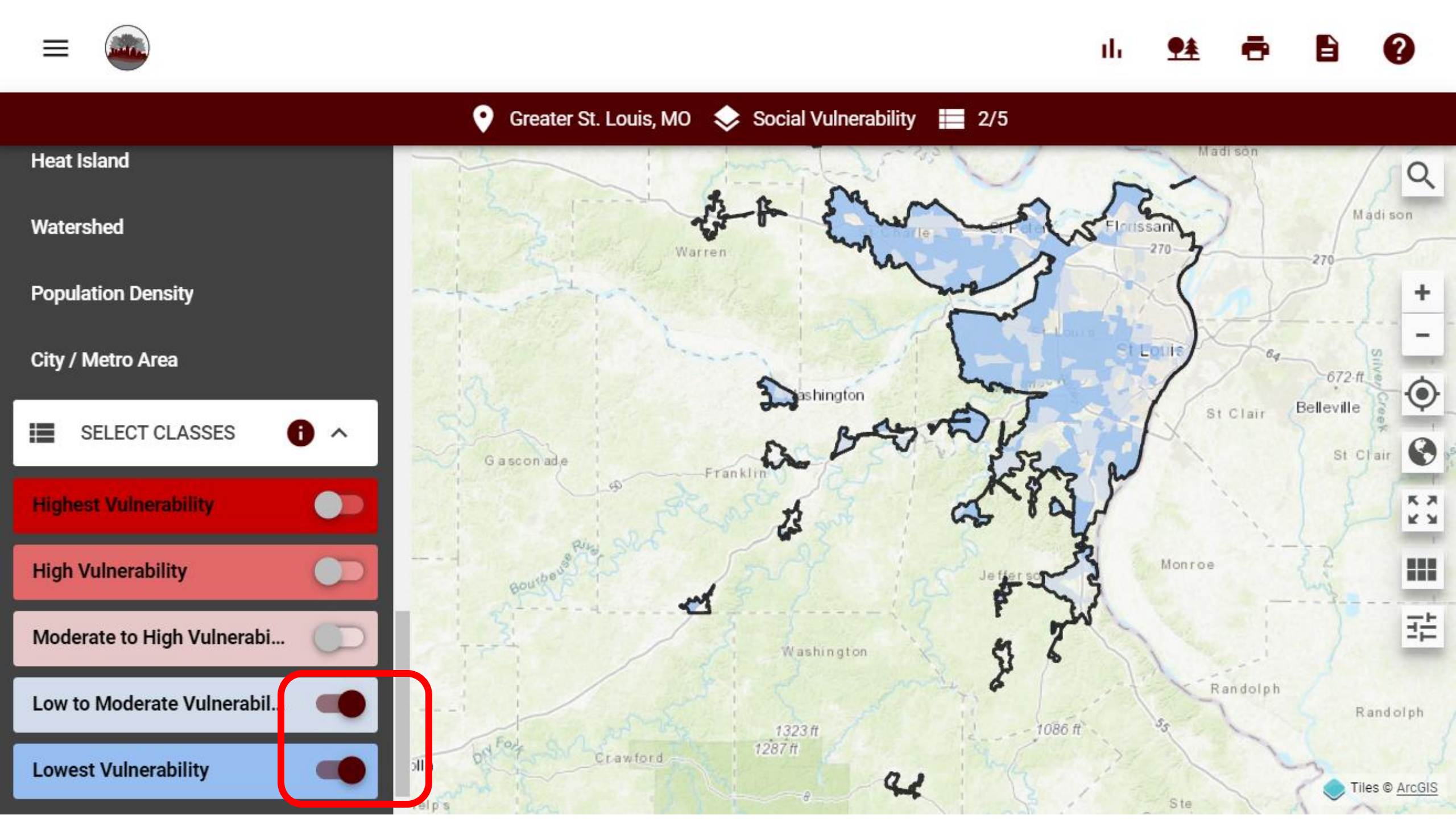






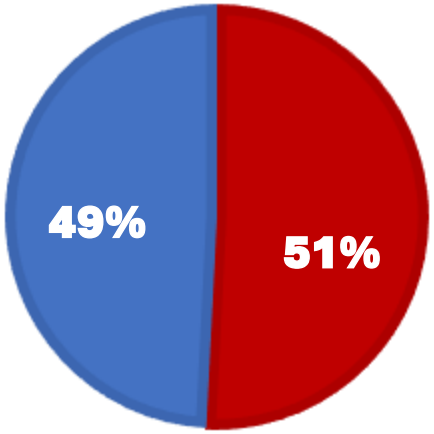
Social Vulnerability high to low →


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
Warren
St Charles
Madison
St Louis
Washington
Franklin
Gasconade
Bourbeuse River
Jefferson
Monroe
Randolph
Crawford
Dry Fork
Belleville
St Clair
Silver Creek
672 ft
1323 ft
1287 ft
1086 ft
270
64
55
Tiles © ArcGIS

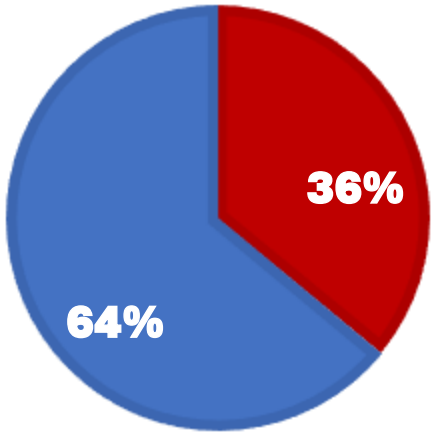

Greater St. Louis, MO
Social Vulnerability
2/5
Heat Island
Watershed
Population Density
City / Metro Area
SELECT CLASSES
Highest Vulnerability
High Vulnerability
Moderate to High Vulnerabi...
Low to Moderate Vulnerabil...
Lowest Vulnerability
Madison
Warren
Florissant
St Louis
Washington
Gasconade
Franklin
St Clair
Belleville
Monroe
Jefferson
Randolph
Crawford
Bourbeuse River
Dry Fork
Silver Creek
1323 ft
1287 ft
1086 ft
672 ft
Tiles © ArcGIS

Population Distribution by SVI Class

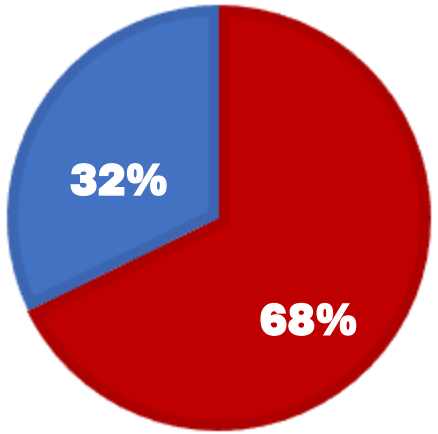
Washington, DC



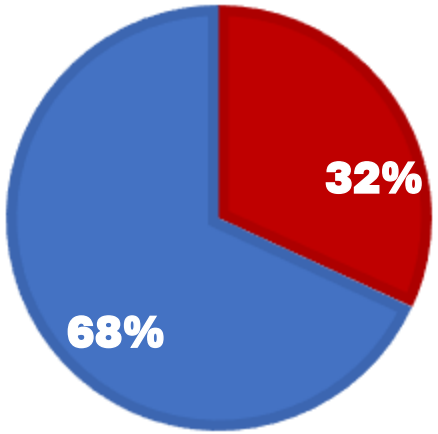
Greater St. Louis, MO

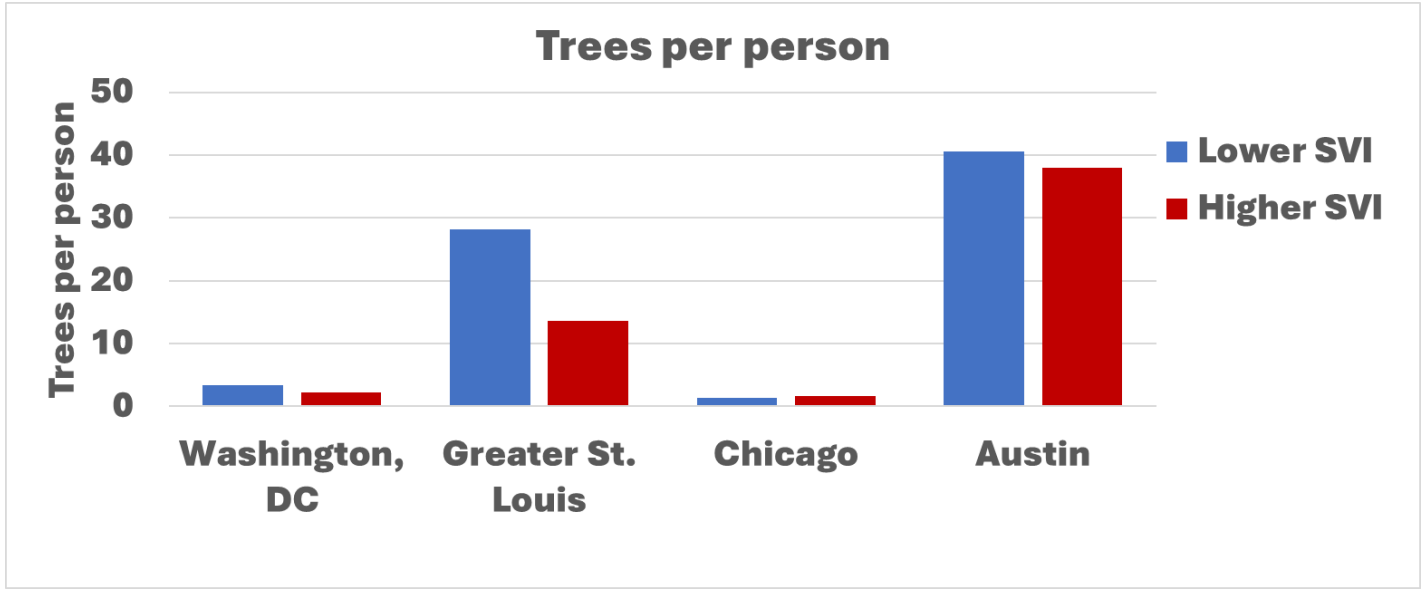


Chicago, IL



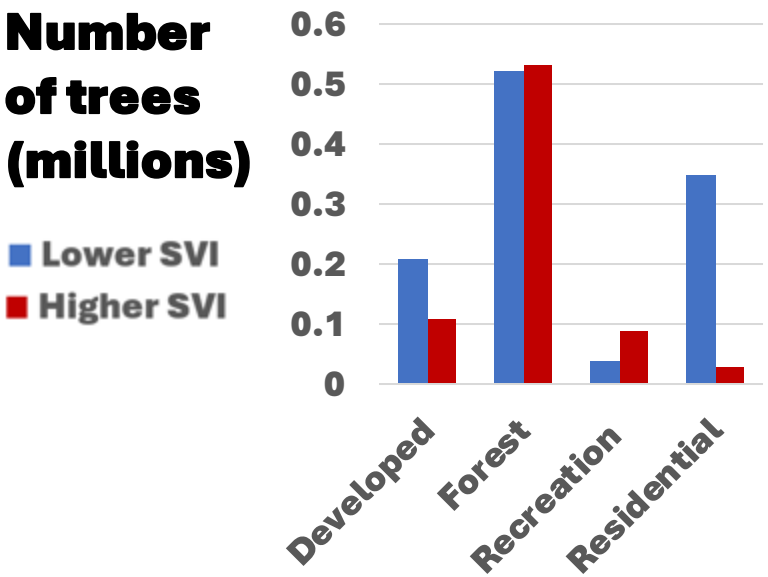
Austin, TX



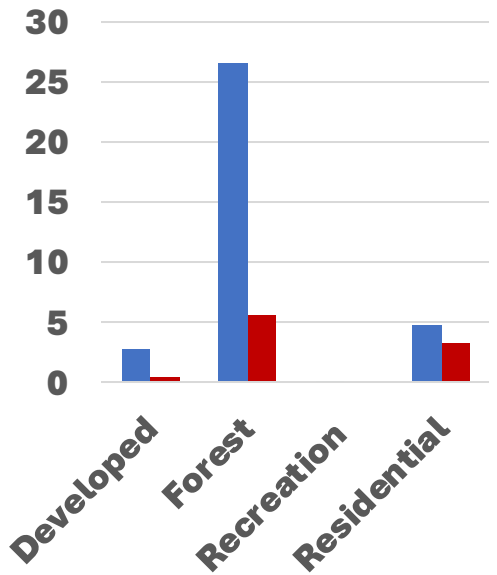


Number of Trees by Land Use and SVI

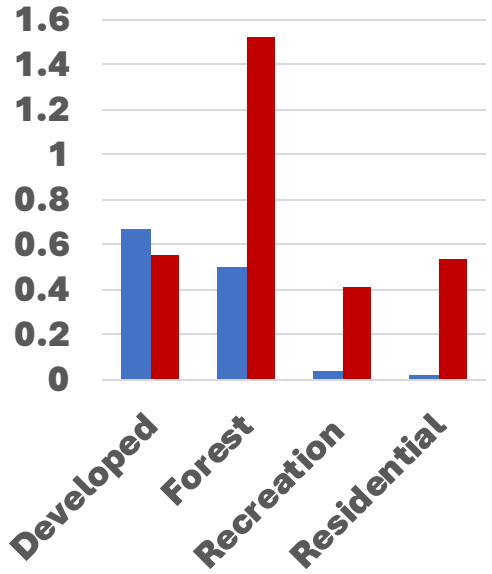
Washington, DC



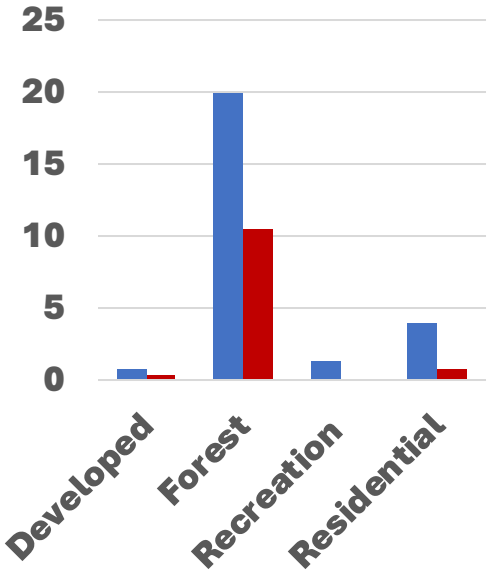
Greater St. Louis, MO



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

- 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 (I
- 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 pounc
- 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 tal
reader, it is recommended to adjust ve
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 percen 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

Food and Agriculture Organization of the United Nations

Arbor Day Foundation

POLITECNICO MILANO 1863

ISA International Society of Arboriculture

Smithsonian

Forest Service U.S. Department of Agriculture

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

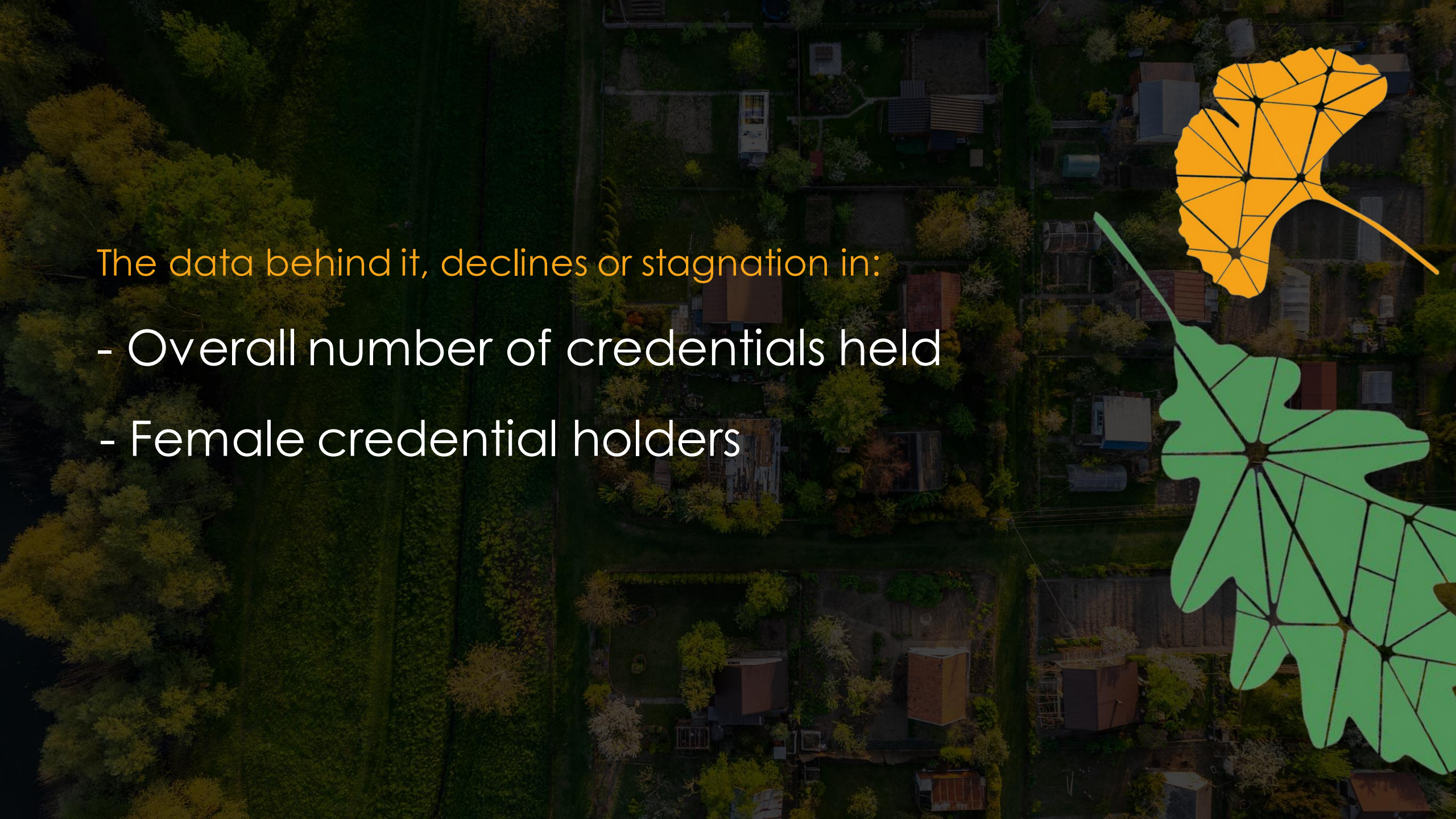
ATD Certified Professional in Talent Development

What's in a brand?

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

This was our brand…

What messages or stories does it convey?



The data behind it, declines or stagnation in:

- Overall number of credentials held
- Female credential holders

What did we do with the findings?

Brand naming and design evolution

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

FUTURE
ARBORIST

Thank you

Luana Vargas| International Society of Arboriculture

lvargas@isa-arbor.com

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