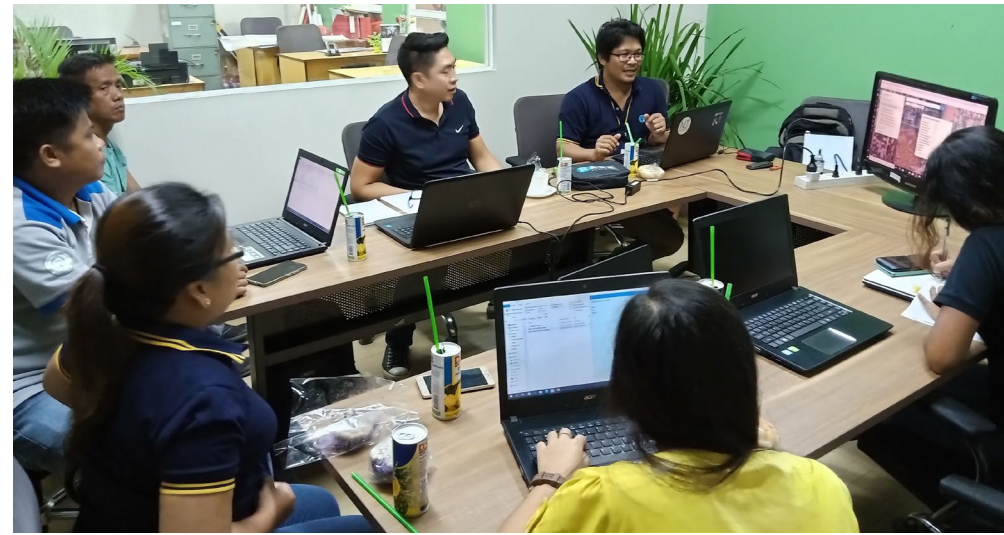


Plan for today

1. Setting up your first project
2. Key decisions
3. Putting i-Tree Eco results to work
4. Is i-Tree Eco right for you?



The 2023 i-Tree Suite of Tools



Core individual tree tools



Core canopy tools



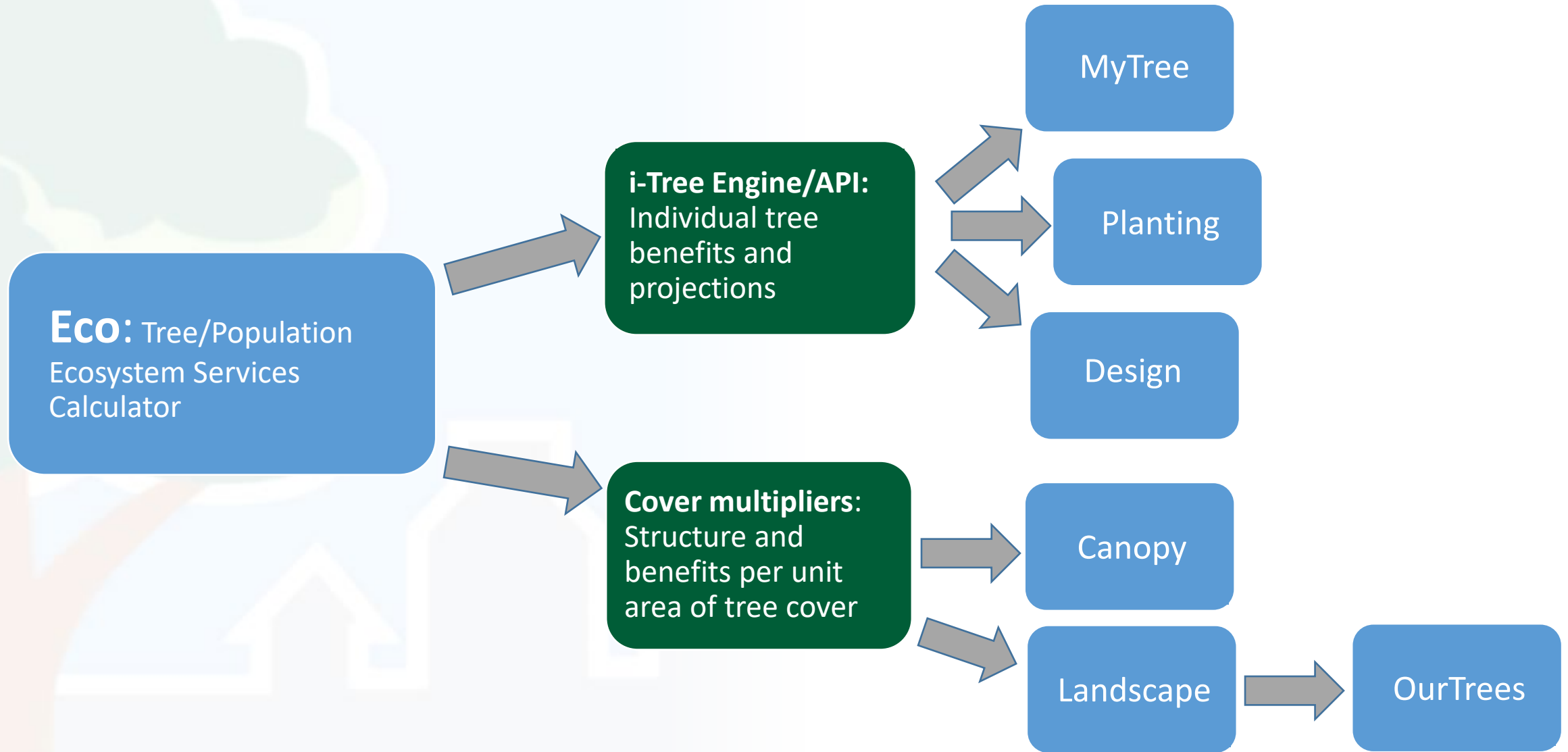
* *i-Tree Tools that can be used internationally*



i-Tree is a Cooperative Initiative among these partners



i-Tree Tool Relationships



i-Tree is a Cooperative Initiative among these partners



The i-Tree Eco Framework

Structure



- Summary of field measurements
- Leaf area
- Condition
- Species distribution
- Diameter distribution

Function



- Air quality improvement
- Energy effects
- Carbon storage & sequestration
- Hydrology effects
- Shade ultraviolet effects (UV)
- Foodscape characteristics - *limited species info*
- Wildlife suitability – avian focus
- Volatile organic compound VOC
- Leaf nutrients

Value

- Monetary value
- Equivalent values
- Health outcomes
- Cost Benefit analysis
- Summaries for management

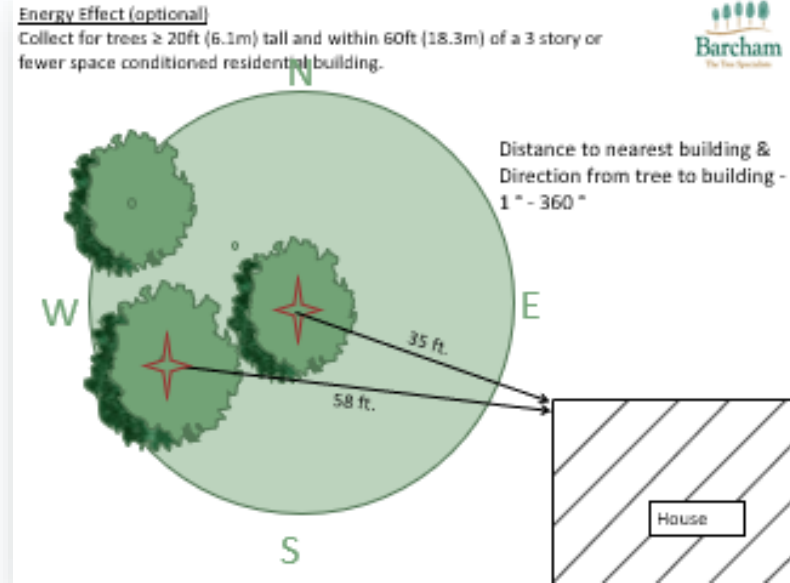
Eco flexible tree data variables

Minimum Required Tree Data

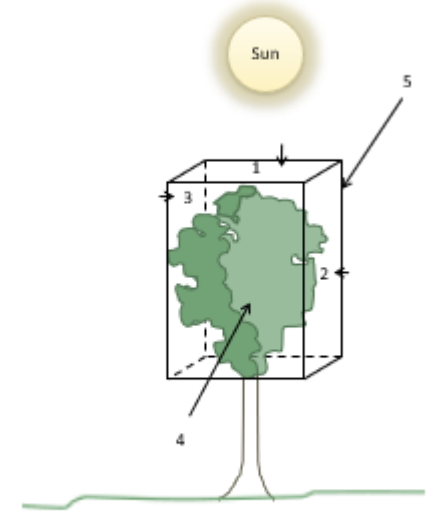
1. Tree species
2. Diameter at breast height (DBH)

Optional but Recommended Tree Data

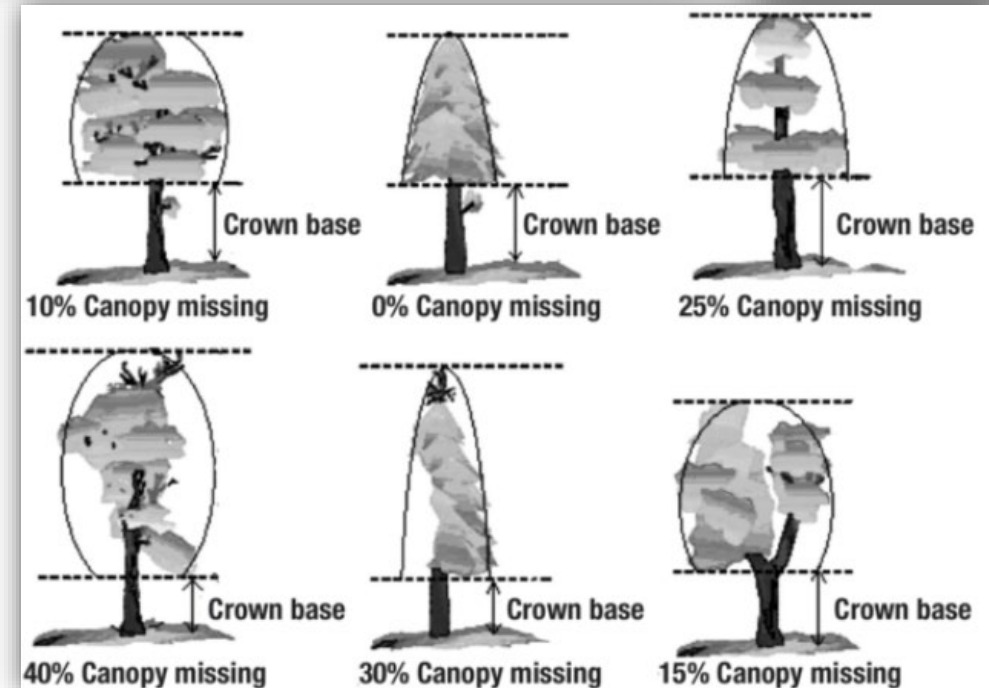
3. Total tree height
4. Height to live top
5. Height to crown base
6. Crown width (N-S)
7. Crown width (E-W)
8. % Crown missing
9. % dieback (condition)
10. Crown light exposure (CLE)
11. Land use



CROWN LIGHT EXPOSURE



CLE affects tree growth rates and accounts for competition with other trees for access to light.



From field data to results

Understanding i-Tree: 2021 Summary of Programs and Methods

David J. Nowak



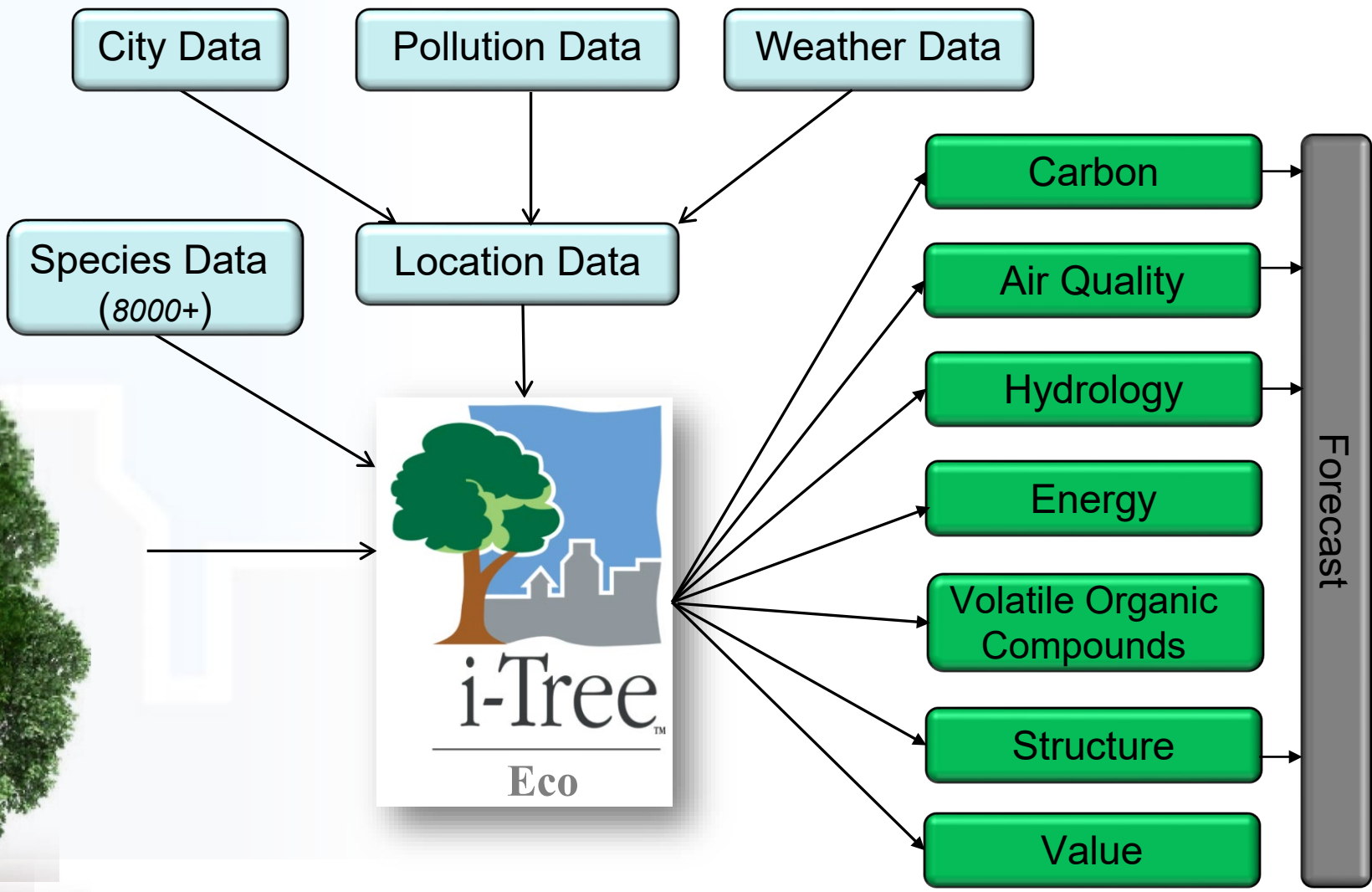
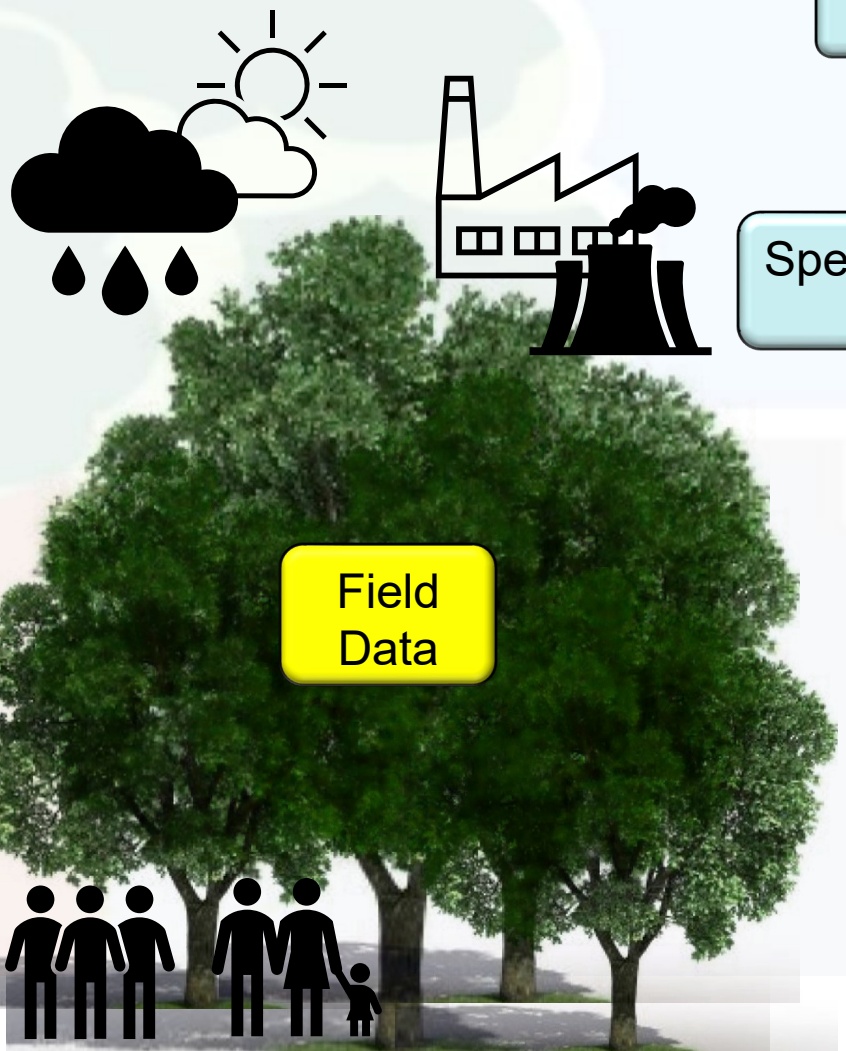
Table 2.—Summary of which directly field-measured characteristics are used to estimate derived variables and ecosystem services. D= directly used; I= indirectly used; C= conditionally used.

	DERIVED VARIABLES		ECOSYSTEM SERVICES										
	Leaf Area	Leaf Biomass	Carbon Storage	Gross Carbon Sequestration	Net Carbon Sequestration	Energy Effects	Air Pollution Removal	Avoided Runoff	Transpiration	VOC Emissions	Compensatory Value	Wildlife Suitability	UV Effects
DIRECT MEASURES													
Species	D	D	D	D	D	D	I	I	I	D	D		
Diameter at breast height (d.b.h.)			D	D	D						D	D	
Total height	D	D	C	C	C	D	I	I	I	I		D	
Crown base height	D	D	C				I	I	I	I			
Crown width	D	D	C				I	I	I	I			
Crown light exposure			C	D	D								
Percent crown missing	D	D	C	C	C	D	I	I	I	I			
Crown health (condition/dieback)				D	D						D	D	
Field land use				D							D	D	
Distance to building						D							
Direction to building						D							
Percent tree cover						D	D	D				D	D
Percent shrub cover							D					D	
Percent building cover						D							
Ground cover composition							I					D	

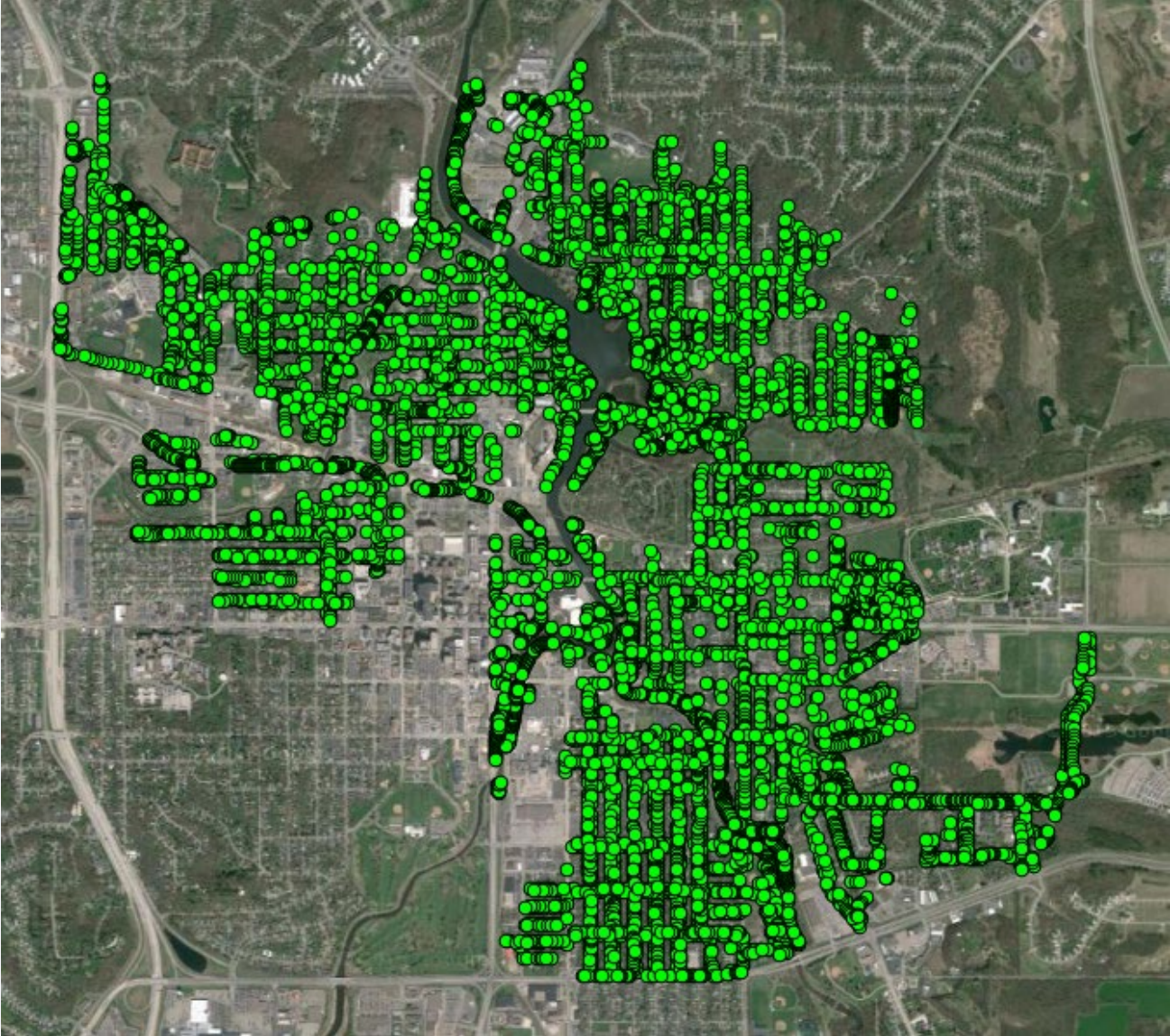
Tree Data

Plot Data

i-Tree model basics: Inventory data → tree benefits?



Let's set-up an i-Tree Eco project



Rochester, MN
Street Tree Inventory

Key Decision: sample or complete inventory



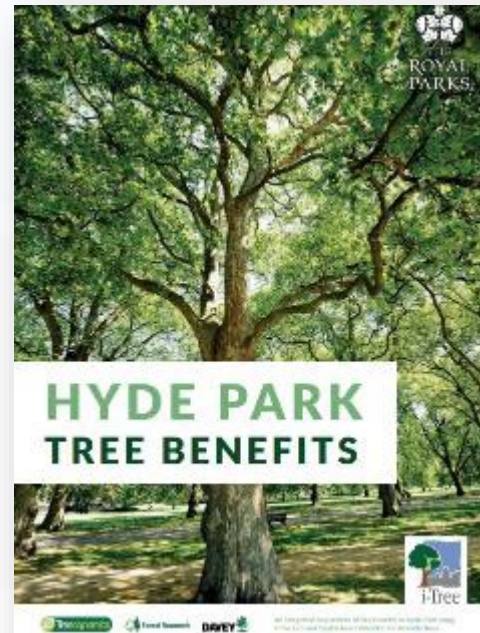
Random sample of plots

- City
- County
- Regional or watershed
- Large scale or forested areas



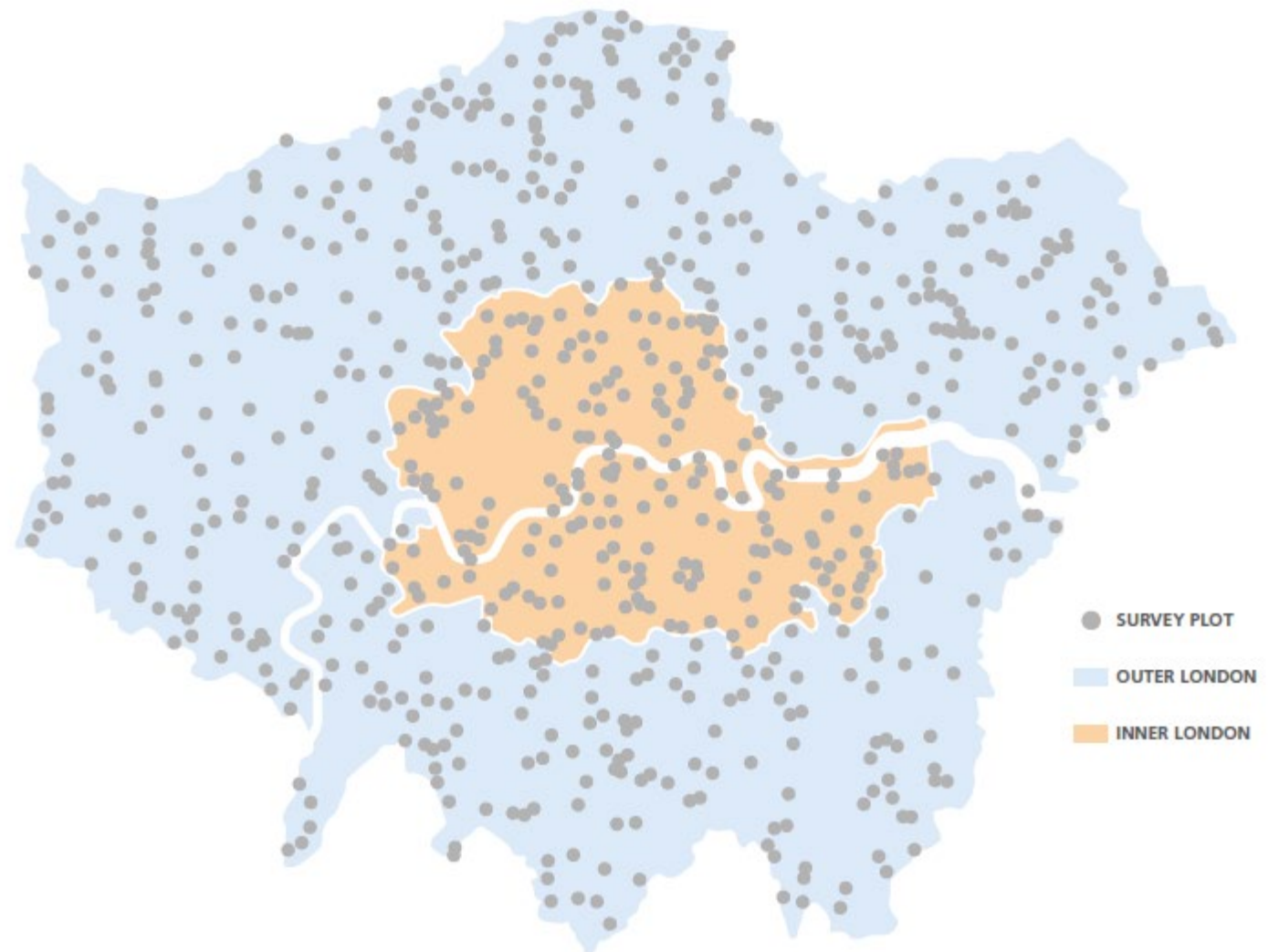
Complete inventory

- Parks
- Campuses
- Residential properties
- Specimen or single trees
- Only trees of interest



What is a sample and why would you do it?

- A small subset of the items you are interested in
- Easier than measuring the whole thing
- For statistical reasons must be random
- We can estimate how well our sample represents the whole population
- This is how London measures 8.5 million trees



What is a plot?

- By default 37.2 ft in radius, $1/10^{\text{th}}$ acre in area.
- Plot size can be changed
- Tradeoffs between plot size and the number you can measure



Sample Plots vs. Complete Inventory

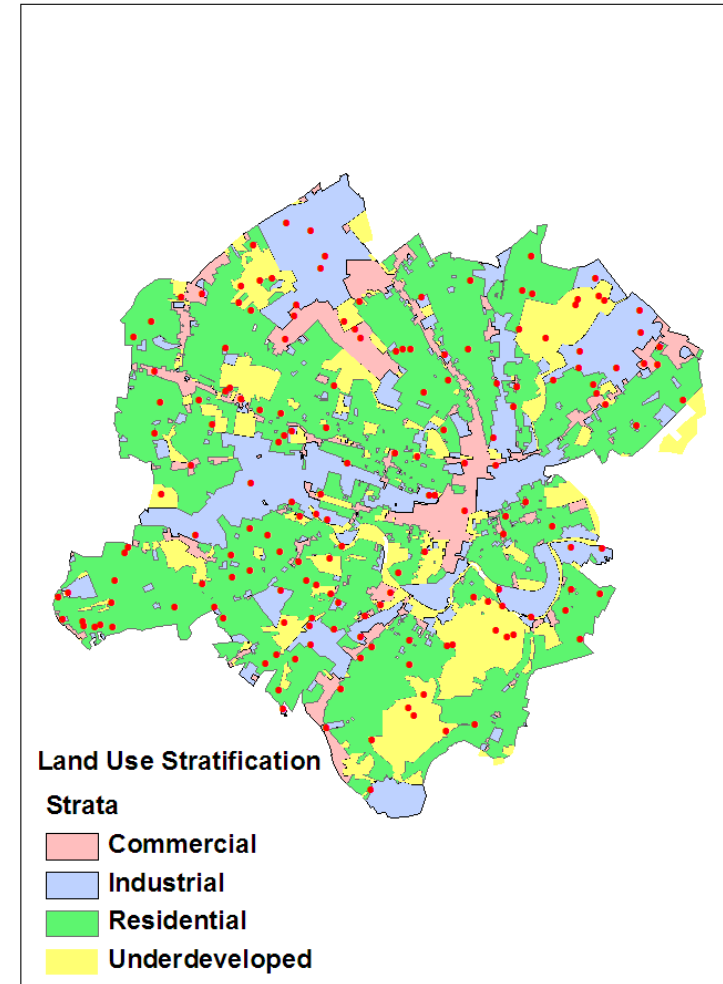


Characteristic	Sample	Complete
Recommended area	City or larger	Any
Number of plots	200 or more	None
Typical number of trees	>500	Any
Access	Numerous permissions usually required	Often no permission required
Accuracy	Some loss of accuracy due to sampling error	No sampling error, all trees of interest measured
Results	Estimates expanded to whole area of interest	Estimates only for measured trees

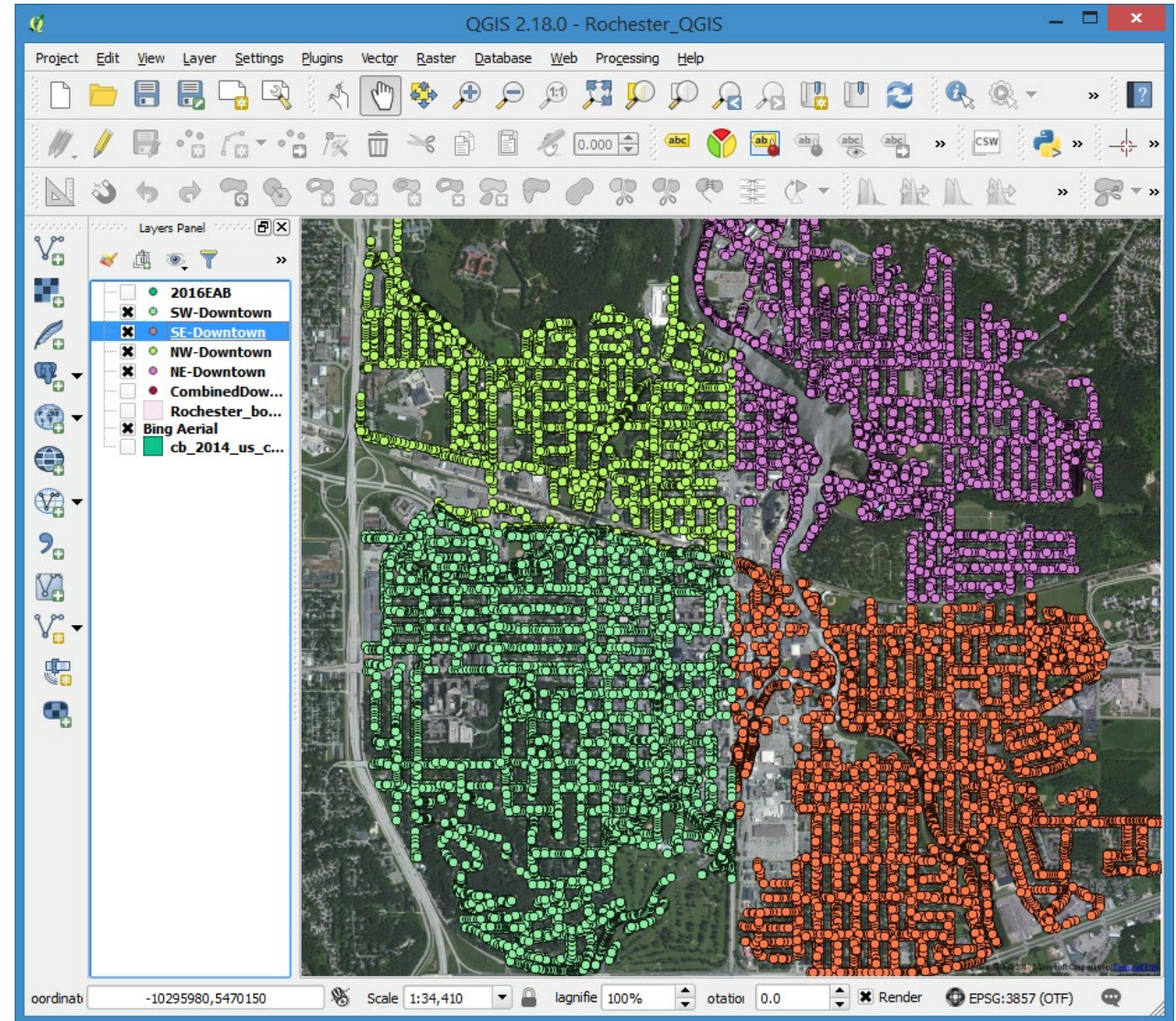
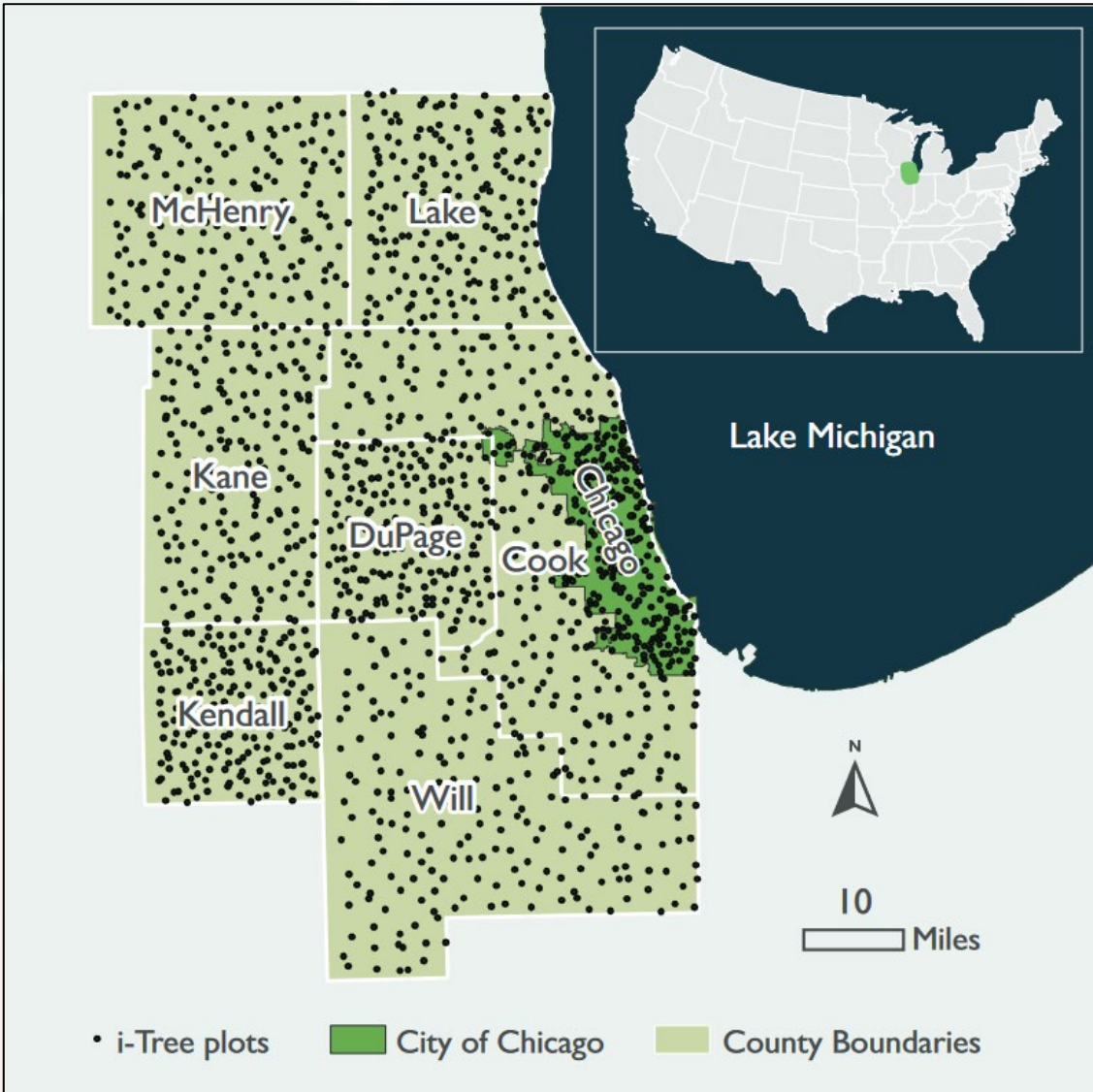
Key Decision: Will you stratify?

Dividing area of interest into categories

- Can be performed by any categories of interest (land use, ownership, political, watershed, etc.)
- Summaries generated by categories of interest
- Perform pre- or post- measurement (sample must be random)
- Can improve statistical accuracy



Stratification: Sample and complete inventory



https://mortonarb.org/app/uploads/2021/05/2020-Chicago-Region-Tree-Census-Report__FIN.pdf

Key Decision – Data entry manual, mobile, or import



i-Tree Eco v6 sample plot data sheet

Sheet _____ of _____ Check when plot is completed
Initials: _____

Plot Information

Plot ID:	Strata:	GPS Coordinates	Date:	Crew:	Plot Size:
		Lat.			
		Long.			

Plot Address: _____

Plot Contact Name: _____ Contact Type or Title: _____

Phone #: _____ Email: _____

Plot or Access Notes: _____

Plot Tree Cover (%)	Shrub Cover (%)	Plantable Space (%)	Percent of Plot Measured (%):

Did this Plot have any Trees? (Y/N): _____ Permanent stake used? (Y/N): _____

Photo ID(s): _____



[Project: Adrian] [Series: Adrian_2012] [Year: 2012] - i-Tree Eco v6.0.4

File Project Configuration Data View Reports Forecast Support

Paper Form Submit to Mobile Retrieve from Mobile Plots Trees Shrubs Check Data CSV KML Benefit Annual Prices Costs Editing Mode: Off

Data Collection Inventory Data Export Inventory Value

Help

Data > Inventory Data > Plots

The **Plots** function seen in the action panel to the right is where you can enter or edit the plot data that you collected in the field (see Notes below). The upper table displays your plot data. While working in this table, you may use the tools in the **Actions** group to help manually enter new data or edit data that has already been added.

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4. Unhide the lower table by clicking on one of the tabs at the bottom of the action panel and clicking on the pin button again.

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1. Click in the box where you would like to enter data and begin typing.
2. Use the Tab key on your keyboard or the left and right arrows to move from

ID	Ude (Y)	Longitude (X)	Date	Crew	Contact Info	Size (:	Photo ID	Stake	% Tree	% Shrub	% P
1	8656011	-84.0385827151	4/24/2...	Team 2	fda fdsa fgr	0.10		<input type="checkbox"/>	10% - 15%	1% - 5%	30% -
2	38815014	-83.9977850608	4/18/2...	Team 1		0.10		<input type="checkbox"/>	1% - 5%	65% - 70%	10% -
3	15508679	-84.0575169972	4/25/2...	Team 2		0.10		<input type="checkbox"/>	1% - 5%	10% - 15%	30% -
4	4037655	-84.0336271443	4/23/2...	Team 1		0.10		<input type="checkbox"/>	1% - 5%	1% - 5%	0%
5	78022666	-84.0433420921	4/24/2...	Team 1		0.10		<input type="checkbox"/>	0%	5% - 10%	0%
6	797495	-84.0634443259	4/19/2...	Team 1		0.10		<input type="checkbox"/>	0%	0%	30% -
7	10326133	-84.0622901734	4/19/2...	Team 2		0.10		<input type="checkbox"/>	45% - 50%	1% - 5%	5% - 1
8	08126706	-84.0363356381	4/24/2...	Team 1		0.10		<input type="checkbox"/>	15% - 20%	0%	15% -
9	96562689	-84.069754892	4/19/2...	Team 2		0.10		<input type="checkbox"/>	0%	0%	100%
10	1926253	-84.0396421345	4/24/2...	Team 1		0.10		<input type="checkbox"/>	0%	0%	0%
11	72922179	-84.0192211756	4/27/2...	Team 2		0.10		<input type="checkbox"/>	95% - 99%	1% - 5%	0%

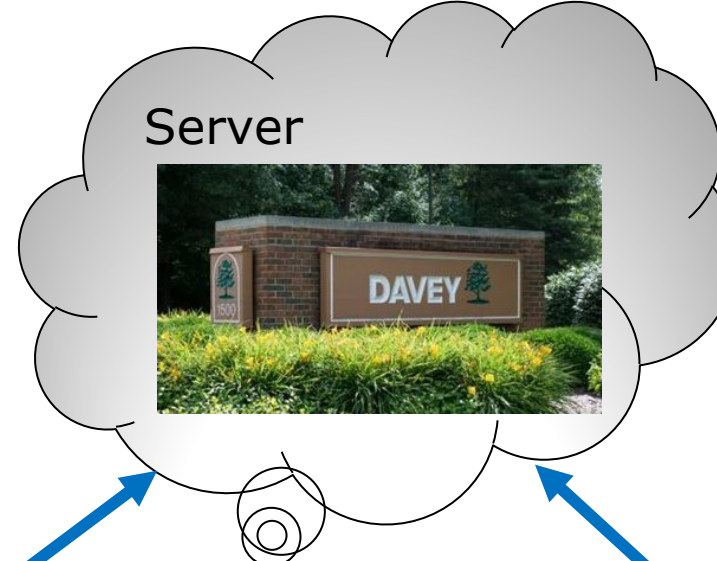
Trees

ID	Survey Date	Status	Distance (ft)	Direction	Species	Land Use
1	4/27/2012	Ingrowth	11.80	338	Shelbark hickory (Carya laciniosa)	Vacant
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

Manual data entry:
Collect on paper then directly enter in the
i-Tree Eco interface

Data entry: mobile or manual

- Web-enabled mobile device or paper
- Measure required & optional variables
- Run data in model to obtain results



Lake Forest ParkCity (2010) - i-Tree Eco

FILE Project Configuration Data View Reports Forecast Support

Work with Plots Trees CSV Enable Editing

Inventory Data Export

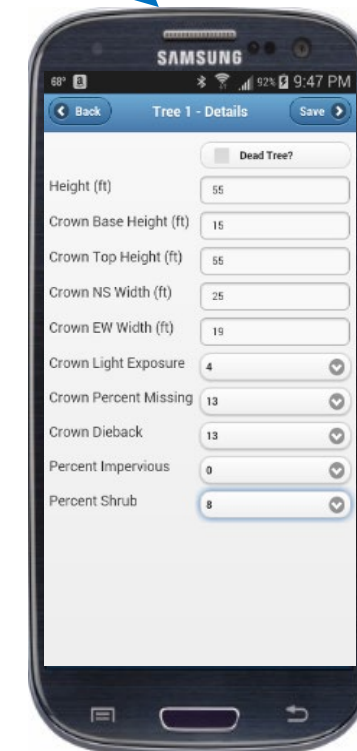
Data > Inventory Data > Plots

ID	Strata	Address	Date	Crew	Contact Info
1	Large Residenti	beach front dr.	8/25/2010	Team 1_Mke	
2	Large Residenti	lake washington	8/25/2010	Team 1_Mke	
3	Large Residenti	lake washington	8/25/2010	Team 1_Mke	
4	Large Residenti	18418 51st pl ne	8/20/2010	Team 1_Mke	
5	Large Residenti	vacant LFP property	8/25/2010	Team 1_Mke	
6	Large Residenti	king county water district vacant lot located at 19520 47th ave. ne.	9/11/2010		
7	Large Residenti	3321 ne 203rd.	9/22/2010		
8	Large Residenti	west side of acacia cem	8/23/2010		
9	Large Residenti	Acacia Cemetery	9/18/2010		
10	Large Residenti	heavily covered invasive himalayan black berry	9/10/2010		
11	Large Residenti	northshore utility district 47th ave ne.	9/19/2010		
12	Small Residenti	15327beach drive ne.	10/14/2010		
13	Small Residenti	19017 largo pl	10/1/2010		
14	Large Residenti	5105 ne 180th st	8/17/2010	Team 1_Mke	
15	Large Residenti	3047 ne 180th st.	10/6/2010		
16	Large Residenti	18404 47th pl ne	9/24/2010	Team 1_Mke	
17	Large Residenti	19820 47th ave ne.	10/4/2010		
18	Large Residenti	18211 Ballinger Way NE	9/26/2010		
19	Large Residenti	19535 35th ave ne	8/31/2010		

Trees

ID	Status	Distance (ft)	Direction	Species	Land Use	DBH 1 (in)
1	Planted	21.00	96	Western redcedar (Thuja plicata)	Vacant	4.2
2	Planted	17.00	104	Western redcedar (Thuja plicata)	Vacant	5.6
3	Planted	26.00	112	Western redcedar (Thuja plicata)	Vacant	7.3
4	Planted	14.00	139	Bigleaf maple (Acer macrophyllum)	Vacant	1.7
5	Planted	11.00	0	Western redcedar (Thuja plicata)	Vacant	6.2
6	Planted	11.00	193	Western redcedar (Thuja plicata)	Vacant	18.0
7	Planted	3.00	193	Western redcedar (Thuja plicata)	Vacant	20.7
8	Planted	20.00	208	Western redcedar (Thuja plicata)	Vacant	4.5
9	Planted	26.00	210	Western redcedar (Thuja plicata)	Vacant	1.7
10	Planted	17.00	232	English holly (Ilex aquifolium)	Vacant	1.4
11	Planted	22.00	231	Douglas fir (Pseudotsuga menziesii)	Vacant	32.3
12	Planted	8.00	235	Western hemlock (Tsuga heterophylla)	Vacant	8.5
13	Planted	18.00	241	English holly (Ilex aquifolium)	Vacant	3.3

Reference Objects Ground Covers Land Uses Trees



Data import



AutoSave Off | Roc... | Henning, Jason | [Icons]

File | Home | Insert | Draw | Page | Form | Data | Review | View | Autor | Devel | Help | Acrot | Powe | [Icons]

Clipboard | Font | Alignment | Number | Conditional Formatting | Cells | Editing | Analyze Data | Styles | Analysis | Sens

B9 | Maackia

Zone	Species	Scientific Name	DBH	CONDITION
1 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

Rochester Street Trees



[Project: Adrian] [Series: Adrian_2012] [Year: 2012] - i-Tree Eco v6.0.4

File | Project Configuration | Data | View | Reports | Forecast | Support

Paper Form | Submit to Mobile | Retrieve from Mobile | Plots | Trees | Shrubs | Check Data | CSV | KML | Benefit Prices | Annual Costs | Editing Mode: Off

Data Collection | Inventory Data | Export | Inventory Value

Help

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3	15508679	-84.0575169972	4/25/2...	Team 2		0.10			1% - 5%	10% - 15%	30% -
4	4037655	-84.0336271443	4/23/2...	Team 1		0.10			1% - 5%	1% - 5%	0%
5	78022666	-84.0433420921	4/24/2...	Team 1		0.10			0%	5% - 10%	0%
6	797495	-84.0694443259	4/19/2...	Team 1		0.10			0%	0%	30% -
7	10326133	-84.0622901734	4/19/2...	Team 2		0.10			45% - 50%	1% - 5%	5% - 1
8	08126706	-84.0363356381	4/24/2...	Team 1		0.10			15% - 20%	0%	15% -
9	96562689	-84.069754892	4/19/2...	Team 2		0.10			0%	0%	100%
10	1926253	-84.0396421345	4/24/2...	Team 1		0.10			0%	0%	0%

Trees

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5	4/27/2012	Ingrowth	17.70	10	Black cherry (Prunus serotina)	Vacant
6	4/27/2012	Ingrowth	35.20	20	Silver maple (Acer sacharinum)	Vacant

Data entry: mobile, manual, or import

Mobile

- Useful for citizen science
- Multiple people can do data entry
- Need device, safety, battery
- Tedious for plots with lots of trees

Manual

- User paper for permanent record
- Fewer potential issues
- Single user
- Slow

Import

- Ultimate flexibility
- Add value to existing inventories
- Quick
- Now works for samples or complete inventory

Let's get some data into i-Tree Eco



Let's get some data into i-Tree Eco

Mobile data entry

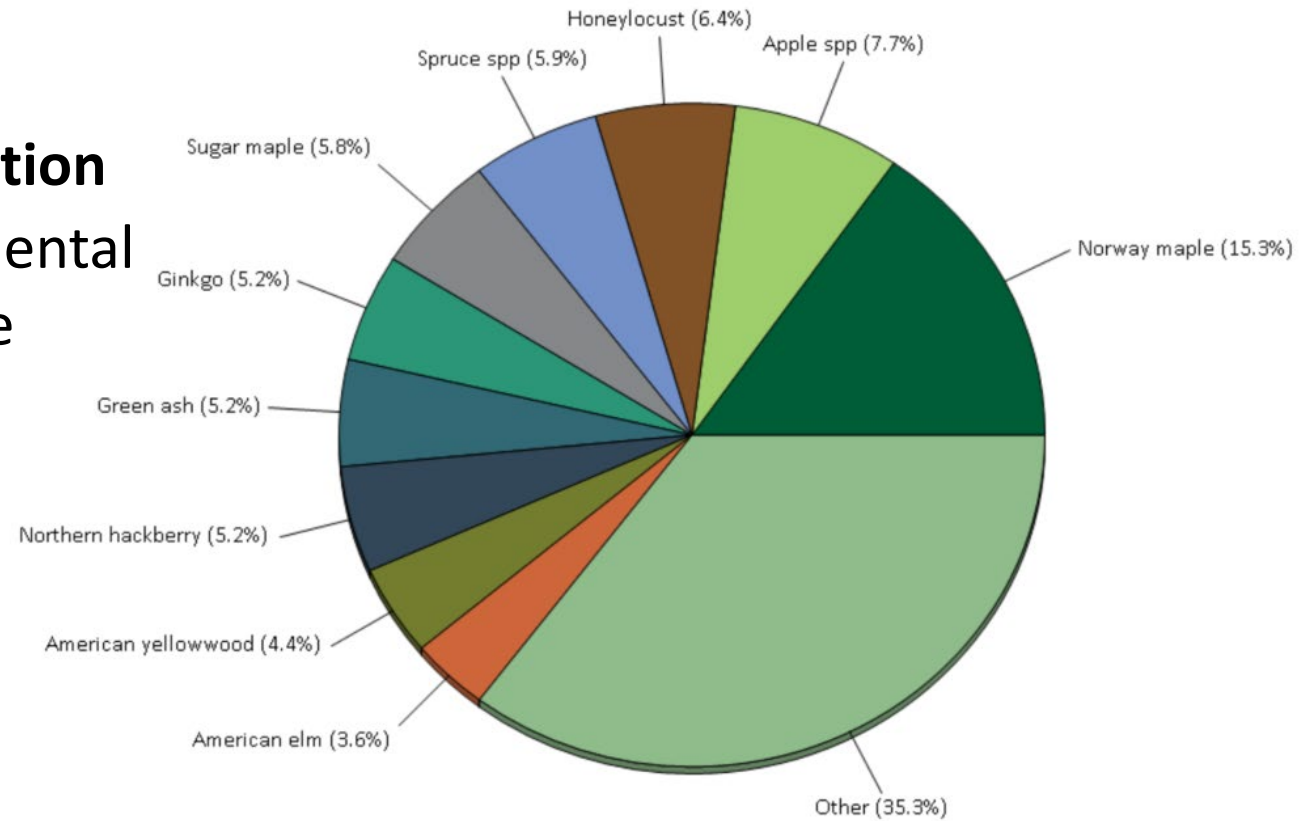
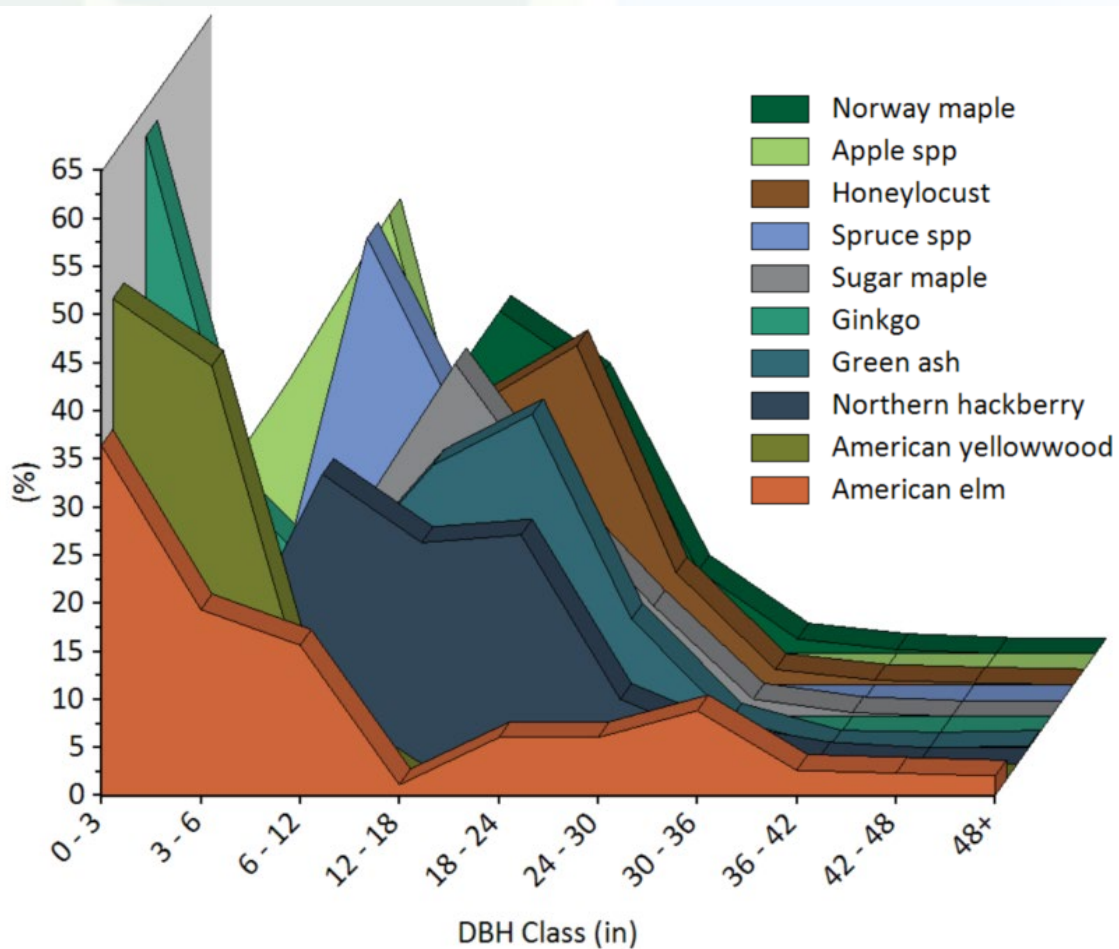


<https://bit.ly/3KMHVSr>

i-Tree Eco structure results

Species Diversity/Composition

Diversity reduces environmental threats, increases resilience



Size/Age Class Distribution

Distribution of age informs sustainability

i-Tree Eco management focused results

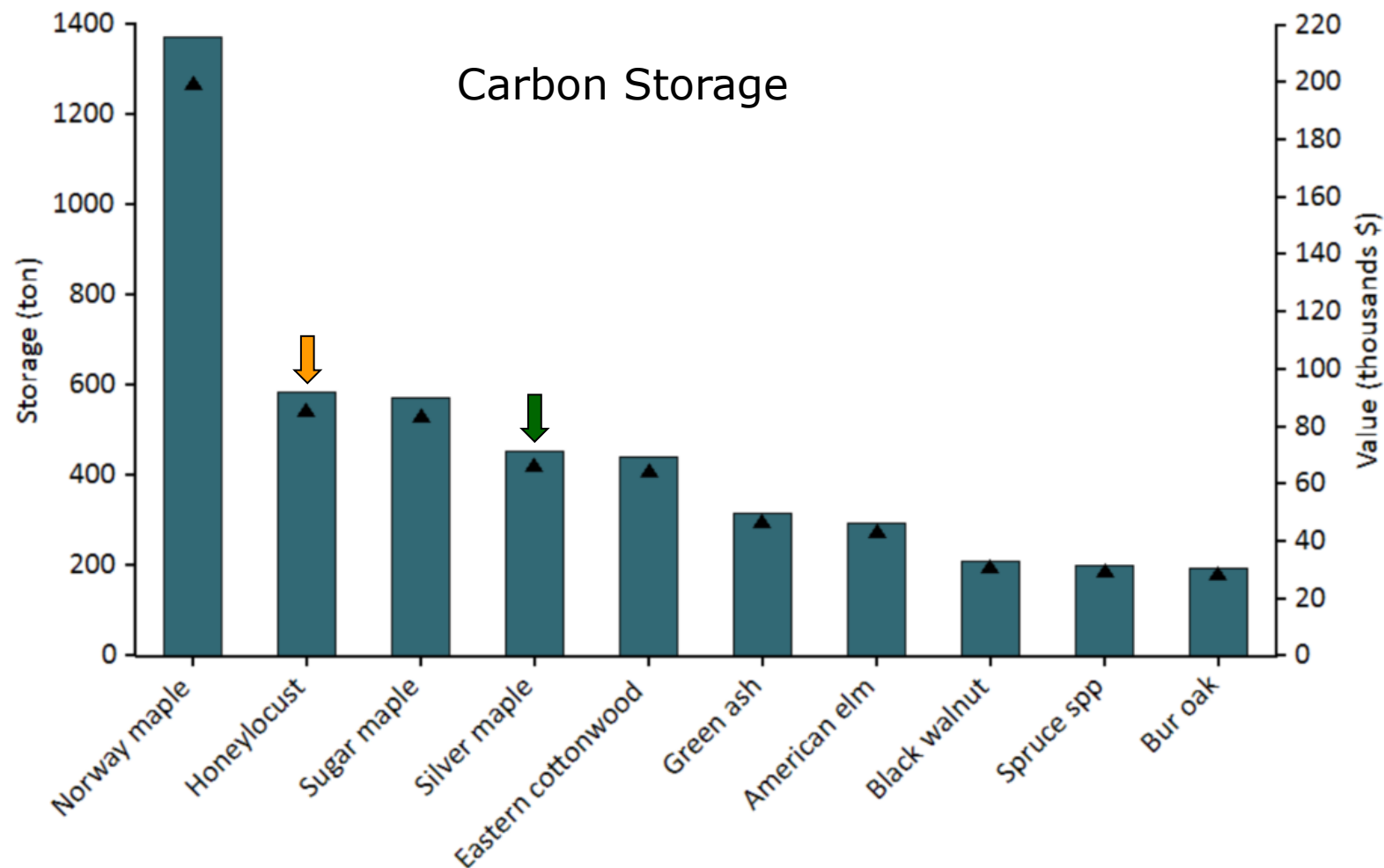


Appendix VI. Potential Risk of Pests

Fifty-three insects and diseases were analyzed to quantify their potential impact on the urban forest.

Code	Scientific Name	Common Name	Trees at Risk (#)	Value (\$ thousands)
AL	<i>Phyllocnistis populiella</i>	Aspen Leafminer	30	8.94
ALB	<i>Anoplophora glabripennis</i>	Asian Longhorned Beetle	5,080	6,037.13
ARCA	<i>Neodothiora populina</i>	Aspen Running Canker	0	0.00
ARD	<i>Armillaria</i> spp.	Armillaria Root Disease	4	2.86
BBD	<i>Neonectria faginata</i>	Beech Bark Disease	0	0.00
BC	<i>Sirococcus clavignenti</i> <i>juglandacearum</i>	Butternut Canker	145	273.64
BLD	<i>Litylenchus crenatae mccannii</i>	Beech Leaf Disease	0	0.00
BM	<i>Euproctis chrysorrhoea</i>	Browntail Moth	891	335.73
BOB	<i>Tubakia iowensis</i>	Bur Oak Blight	105	291.08
BSRD	<i>Leptographium wagneri</i>	Black Stain Root Disease	4	2.86
BWA	<i>Adelges piceae</i>	Balsam Woolly Adelgid	1	0.25
CB	<i>Cryphonectria parasitica</i>	Chestnut Blight	0	0.00
DA	<i>Discula destructiva</i>	Dogwood Anthracnose	0	0.00

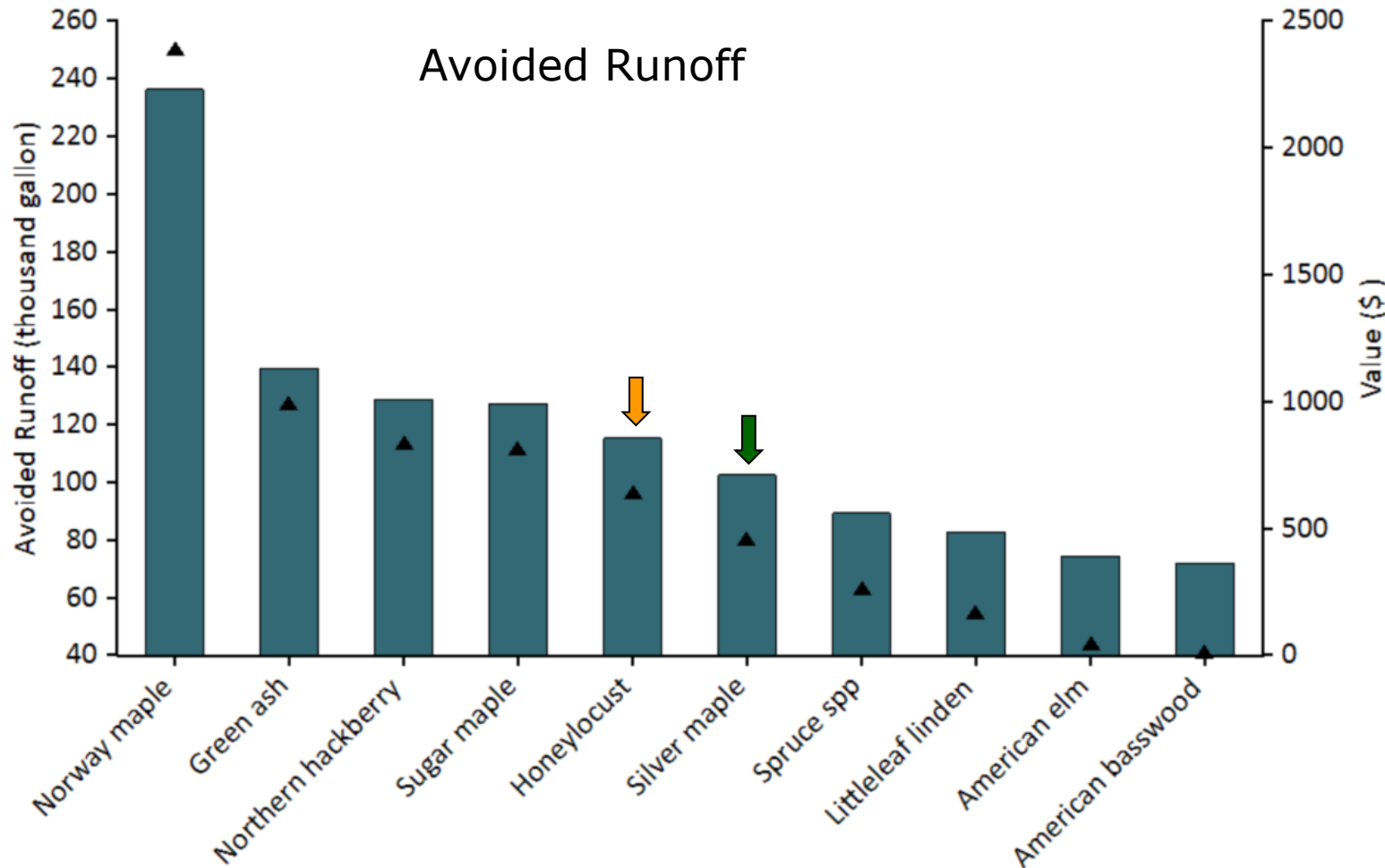
i-Tree Eco tree function



i-Tree Eco tree function



Rochester Inventory Data



Silver maples



Tree count:
247
Leaf area:
33 acres

Honeylocusts



Tree count:
623
Leaf area:
40 acres

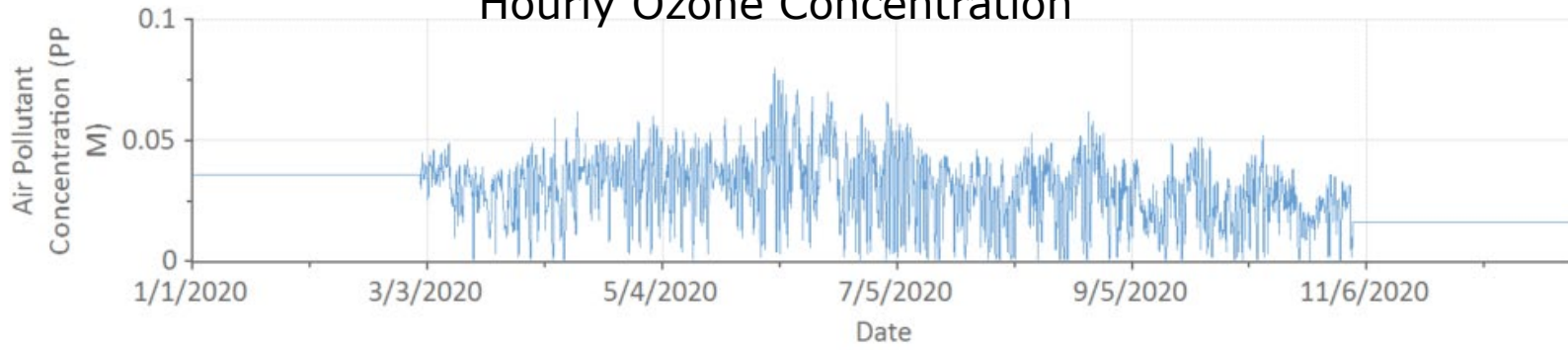
Value (\$)

2500
2000
1500
1000
500
0

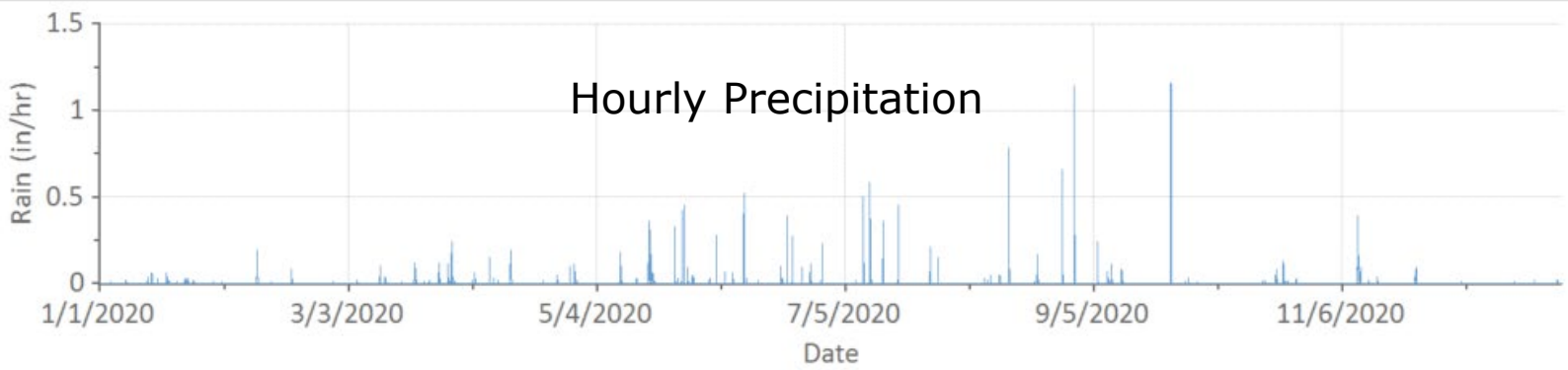
i-Tree Eco detailed results



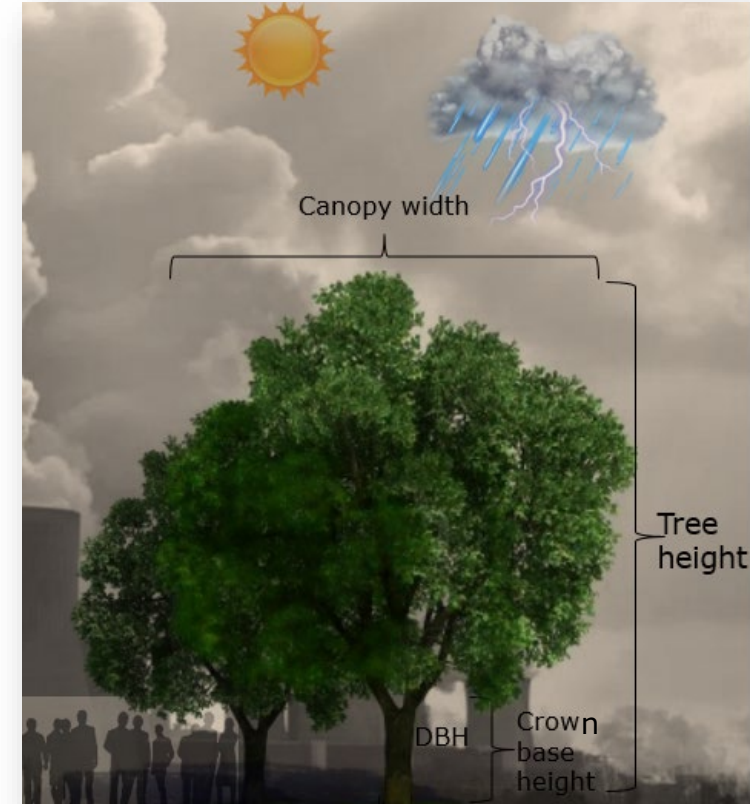
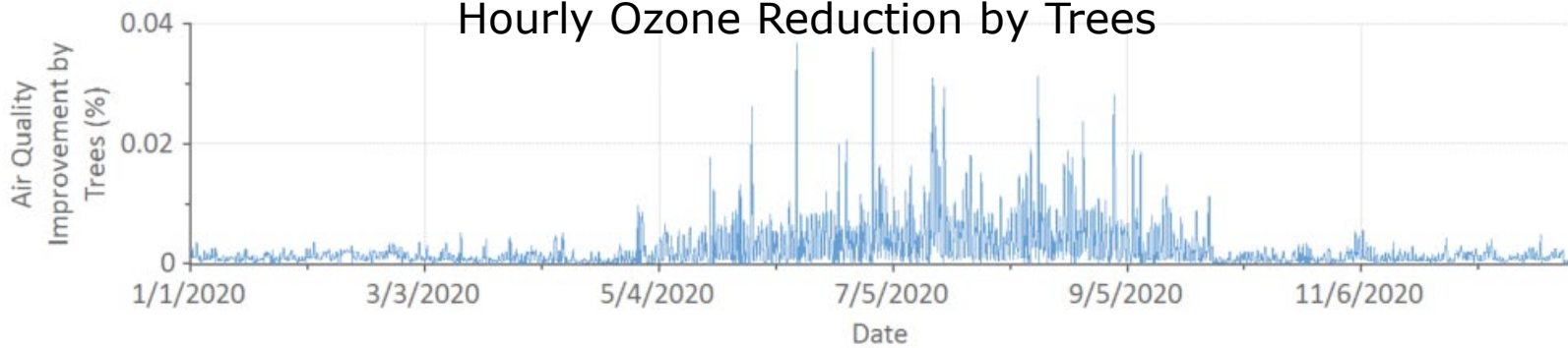
Hourly Ozone Concentration



Hourly Precipitation



Hourly Ozone Reduction by Trees





Air Quality Health Impacts and Values by Trees

Location: Rochester, Olmsted, Minnesota, United States of America

Project: Rochester Street Trees, Series: 1, Year: 2023

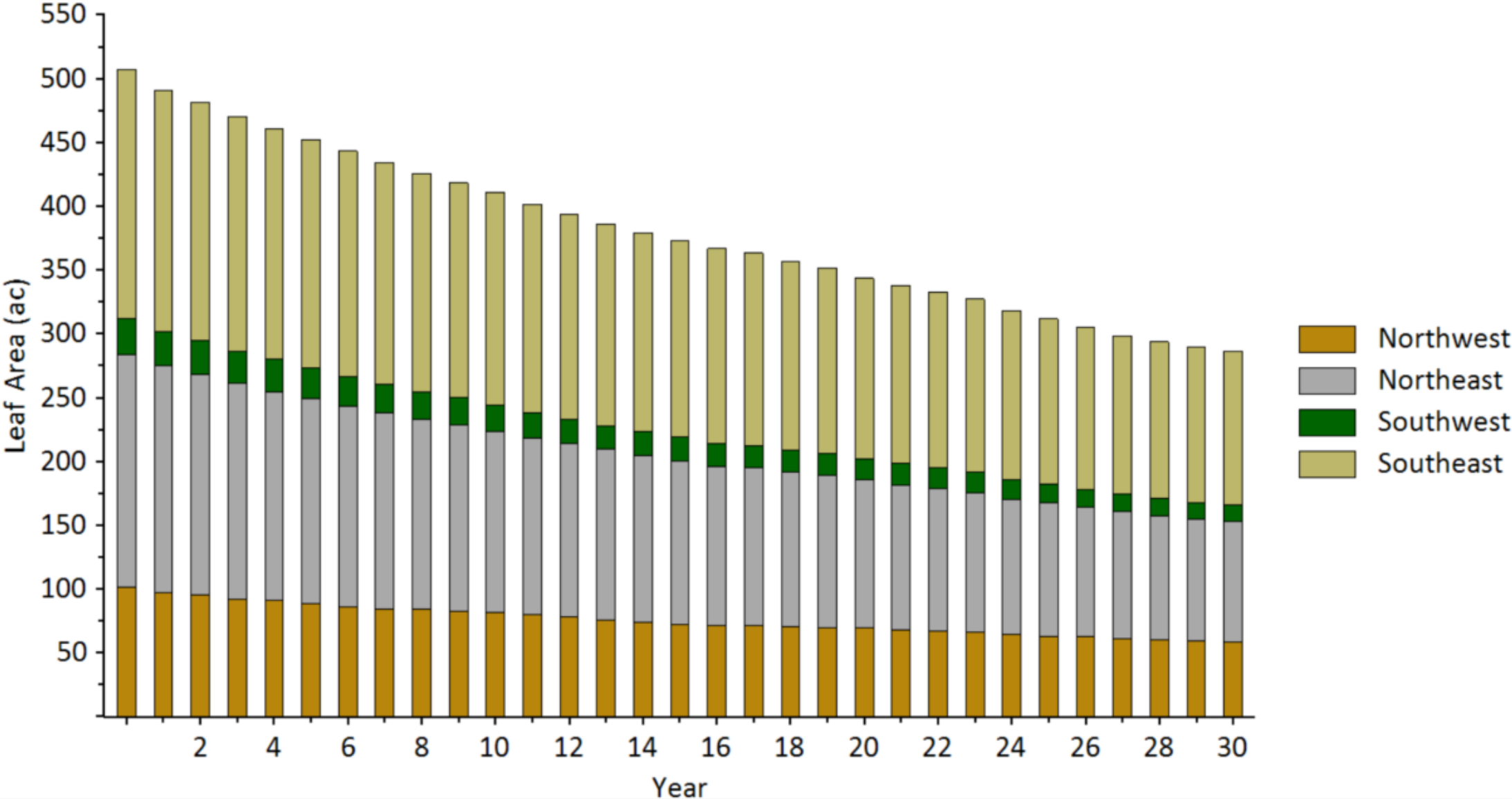
Generated: 4/18/2023

Health Outcome	NO2 (\$/yr)	O3 (\$/yr)	PM2.5 (\$/yr)	SO2 (\$/yr)	All (\$/yr)
Acute Bronchitis			0.05		0.05
Acute Myocardial			13.31		13.31
Acute Respiratory	0.99	77.97	28.87	0.17	108
Asthma Exacerbation	39.16		19.05	3.69	61.9
Chronic Bronchitis			72.41		72.41
Emergency Room Visits	0.10	0.13	0.10	0.05	0.38
Hospital Admissions	21.86	31.31		4.49	57.66
Hospital Admissions,			3.16		3.16
Hospital Admissions,			2.24		2.24
Lower Respiratory			0.34		0.34
Mortality		3153.14	5791.25		8944.39
School Loss Days		38.07			38.07
Upper Respiratory			0.25		0.25
Work Loss Days			8.95		8.95
Total	62.10	3300.62	5939.98	8.41	9311.11

i-Tree Eco Forecast



Leaf Area of Trees Over Time



i-Tree Eco: Thinking big



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NYC MAYOR MICHAEL BLOOMBERG AND BETTE MIDLER PLANT TREE ONE - THE FIRST OF ONE MILLION TREES - AND LAUNCH MILLIONTREESNYC

Today New York City Mayor Michael R. Bloomberg and New York Restoration Project (NYRP) Founder Bette Midler launched the MillionTreesNYC initiative to plant and care for one million trees throughout the City's five boroughs in the next decade. The Mayor and Ms. Midler planted a street tree in the Morrisania section of the Bronx – a neighborhood with too few trees and high rates of asthma – and declared the Carolina Silverbell to be the first of one million trees.

Through a mix of public and private plantings, MillionTreesNYC, an important initiative of *PlaNYC*, will expand New York City's urban forest by 20%. All New Yorkers will share in the many benefits that come from planting trees – more beautiful neighborhoods and parks; cleaner air and water; higher property values; energy savings; cooler summer streets, yards, and public open spaces; and a healthier, more environmentally sustainable City. MillionTreesNYC will get New Yorkers involved in the planting and caring of trees for the next decade.

Mayor Bloomberg and Bette Midler were joined at the announcement by First Deputy Mayor Patricia E. Harris, Deputy Mayor for Economic Development and Rebuilding Daniel L. Doctoroff, Parks Commissioner Adrian Benepe, City Planning Director Amanda M. Burden, Director of the Mayor's Office for Long-term Planning and Sustainability Rohit T. Aggarwala, United States Forest Service Abigail Kimbel and The Home Depot Foundation President Kelly Caffarelli.

"New York City has always been a place of big dreams and big ideas – and our Administration has never been afraid to embrace them," said Mayor Bloomberg. "Over the next decade, with our friends at the New York Restoration Project, we are going to plant an unprecedented one million new trees across the City. *PlaNYC* is our plan to make New York a greener,

i-Tree Eco: Power of stratification



City owned parkland is **9%** of the city

Trees on city owned parkland account for **40%** of carbon storage and sequestration

Feature	Estimate
Number of trees	1,100,000
Tree Cover	64%
Carbon Storage	273,000 tons (\$19.4 million)
Pollution Removal	179 tons/yr (\$6.6 million/yr)

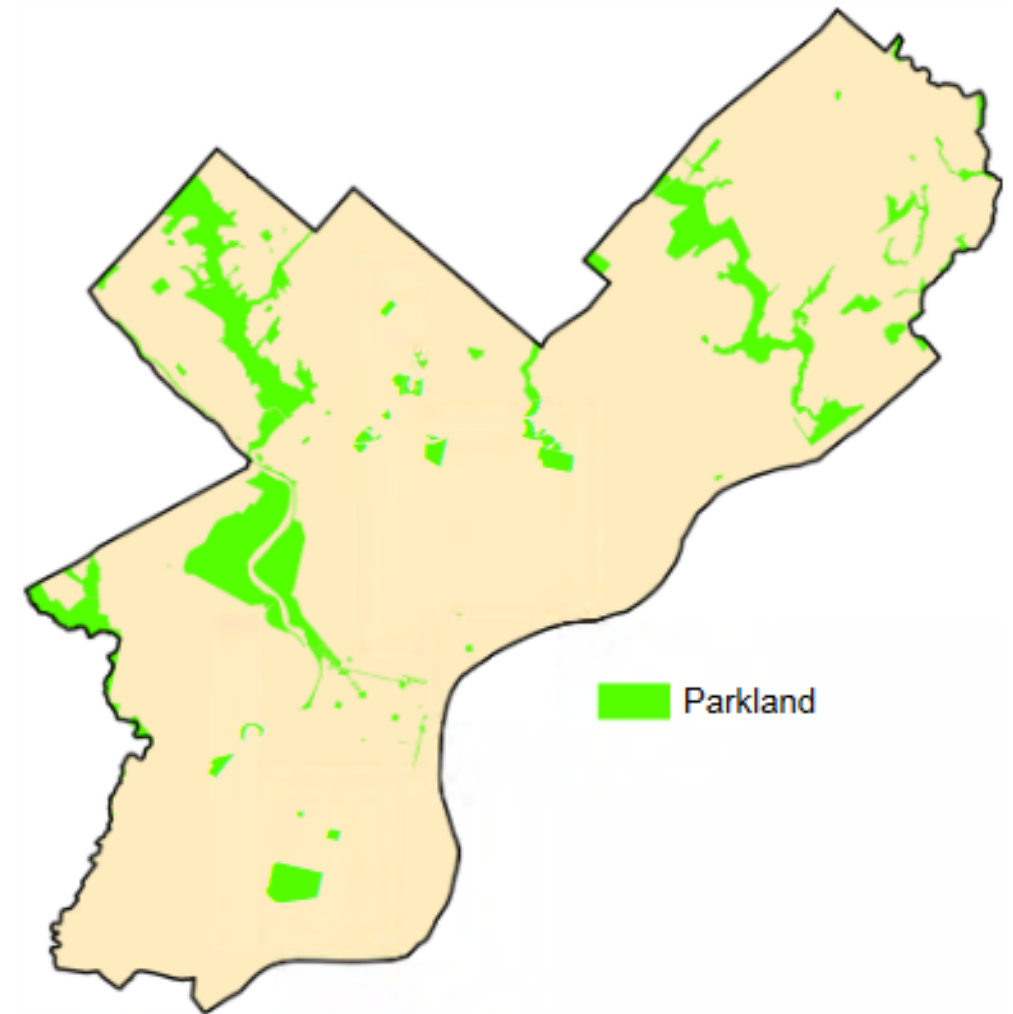
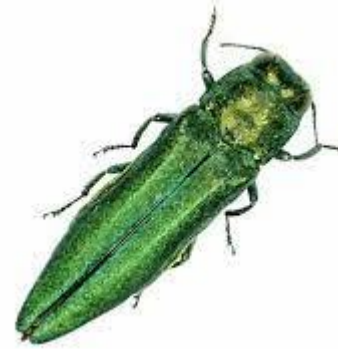


Figure 1.—Philadelphia city boundaries and designated parkland areas, 2012.

i-Tree Eco Example: Large project with targeted results



**Ash Trees:
City stands to lose
7.1% of its forest
and millions in
benefits to
emerald ash borer**



Parameter	Estimate	Units	% of Total City	Species Group Rank
Population	206,996	number	7.1	3
Density	2.3	trees/acre		3
Carbon stored	35,742	tons	5.1	7
Carbon sequestered	1,025	tons/year	3.8	11
Net carbon sequestered	935	tons/year	4.0	10
Leaf area	4,818	acres	5.2	7
Leaf biomass	1,936	tons	6.3	3
Trees, diameter 1-3 in.	111,777	number	54.0 ^a	2
Trees, diameter >18 in.	10,557	number	5.1 ^a	12

^a Percent of all ash trees

i-Tree Eco: Small project with big value



Abington Township Montgomery County, PA



Introduction

Master Tree Action Plan

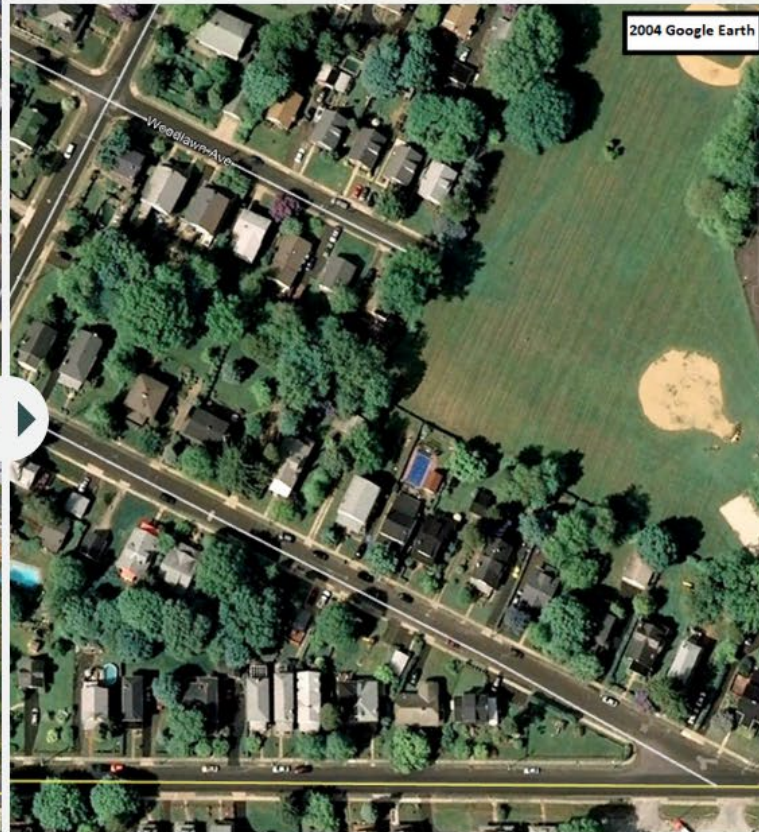
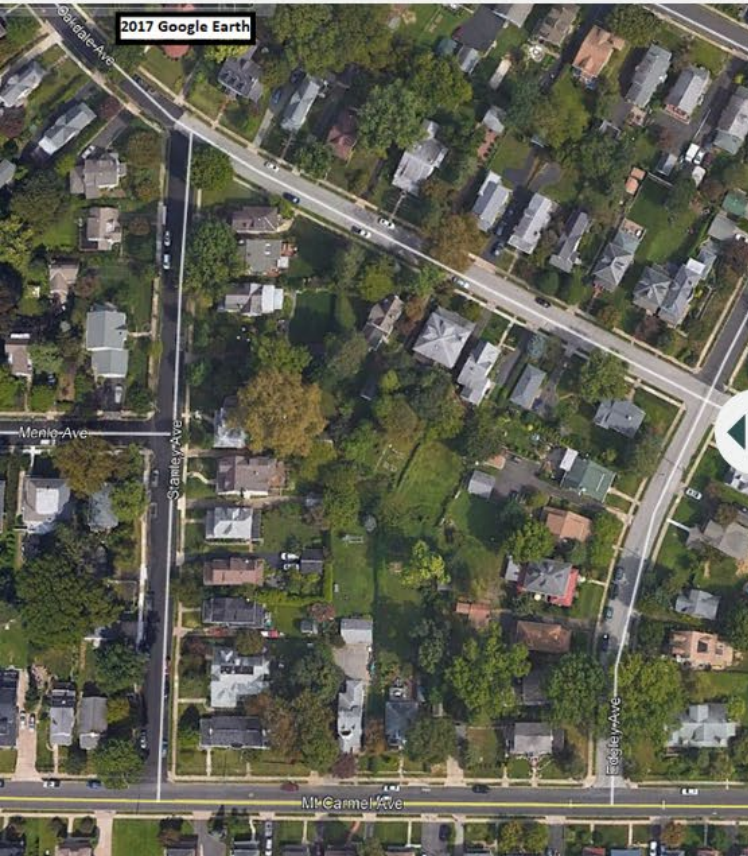
Abington's Urban Tree Canopy

A Closer Look

Tree Canopy Cover by Populatio...

Selected Land Uses

Summ



Tree size matters. The neighborhood's large, mature shade trees have the most leaf area and provide the greatest benefits. **While trees 30" or greater in diameter make up only 8% of the population - their canopies make up 27% of the neighborhood's leaf area.** A comparison of the benefits of an 11" diameter Dogwood tree and a 30" diameter Maple tree growing in the neighborhood shows that the Maple provides nearly 8 times the ecosystem benefits as the Dogwood.

To maximize the benefits Abington's tree canopy provides - we should focus our private property efforts on preserving our existing large trees and planting species that will grow to be large shade trees to replace those we have lost or will lose in the future.

i-Tree Eco: Advantages

- **Local Modeling** – Eco uses available local hourly weather & pollution data and other local characteristics for modeling
- **Dynamic model** – constantly improved with new science, international locations, new reports and functions
- **Flexible data** collection and project design options make Eco accessible to more people (from front yard to whole city)
- The **Eco import** option is a great way to assess existing tree inventory data quickly (format data before importing to save time)

[Project: Oconomowoc Parks] [Series: Park trees] [Year: 2017] - i-Tree Eco

File Project Configuration Data View Reports Forecast Sup

Project Definition Land Use DBH Class Condition Class Project & Strata Area CSV Export Editing Mode: On

Define Data Fields

Project Configuration > Project Definition

Enter project overview information and click OK to save it or Cancel to abort the process.

Project Settings Location Data Collection Options

Hint: Use the Delete key to clear a selection.

Not all cities for international locations are available due to limitation. Select a nearby representative location in these cases.

Nation: United States of America
State: Wisconsin
County: Waukesha
Place: Oconomowoc
Is the study area Urban?
Population: 15759

Please specify the following years for your project:
Weather & Pollution Year: 2015 (Weather and Pollution)

Please select a weather station to use for your project:
Weather Station: 726400-14839 Show Map

Weather Station Selector

Map Satellite

Use the map below to select a weather station to be used with your project. Simply click a station marker to select it; click a different marker if you change your mind.

Location Distance Radius
• 1 mile
• 5 miles
• 10 miles
• 25 miles

Weather Station Icons
Selected
Good Completeness
Fair Completeness
Poor Completeness

Zoom to Selected Station
Zoom to Project Location

GENERAL MITCHELL INTERNATIONAL

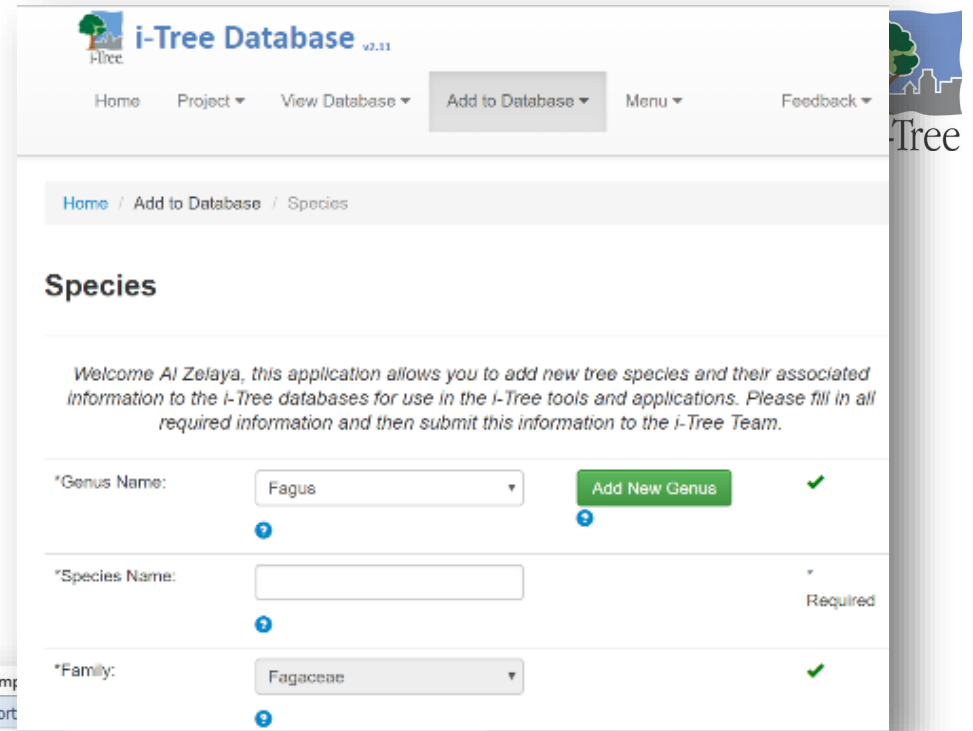
ID: 726400-14839
Year: 2015
Elevation: 204.20 (meters)
Position (lat, lon): 42.95, -87.90
Annual Hourly Precipitation: 858.01 (millimeters)
Annual 6-Hour Precipitation: 851.91 (millimeters)
Collection Completeness: Fair

The data for this station is from the [NCDC](#).

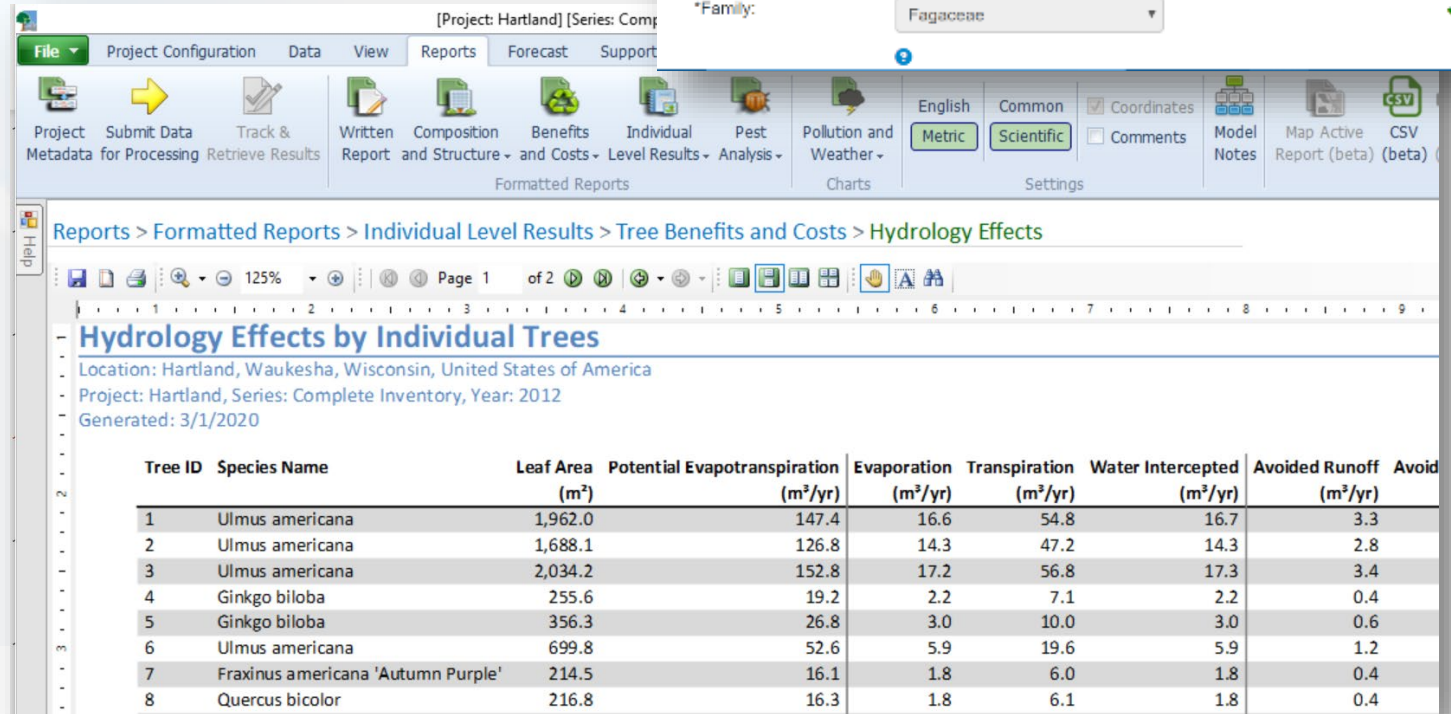
OK

i-Tree Eco: Advantages

- **Options to improve** the model.
e.g. users can submit new species, hourly rainfall data, biomass equations (i-Tree Database)
- **Flexible results** – Eco reports by species, strata and individual tree to help with strategic decision making.



The screenshot shows the 'i-Tree Database v.11' web interface. The top navigation bar includes 'Home', 'Project', 'View Database', 'Add to Database', 'Menu', and 'Feedback'. The breadcrumb trail is 'Home / Add to Database / Species'. The main heading is 'Species'. A welcome message reads: 'Welcome AI Zelaya, this application allows you to add new tree species and their associated information to the i-Tree databases for use in the i-Tree tools and applications. Please fill in all required information and then submit this information to the i-Tree Team.' The form contains three fields: '*Genus Name:' with a dropdown menu set to 'Fagus', a green 'Add New Genus' button, and a green checkmark; '*Species Name:' with an empty text input field and a 'Required' label; and '*Family:' with a dropdown menu set to 'Fagaceae' and a green checkmark.



The screenshot shows the i-Tree Eco software interface. The top menu bar includes 'File', 'Project Configuration', 'Data', 'View', 'Reports', 'Forecast', and 'Support'. The toolbar contains various icons for project management, data processing, and report generation. The breadcrumb trail is 'Reports > Formatted Reports > Individual Level Results > Tree Benefits and Costs > Hydrology Effects'. The report title is 'Hydrology Effects by Individual Trees'. The location is 'Hartland, Waukesha, Wisconsin, United States of America'. The project is 'Hartland, Series: Complete Inventory, Year: 2012'. The report was generated on '3/1/2020'. The report displays a table with 8 columns: Tree ID, Species Name, Leaf Area (m²), Potential Evapotranspiration (m³/yr), Evaporation (m³/yr), Transpiration (m³/yr), Water Intercepted (m³/yr), and Avoided Runoff (m³/yr). The table contains 8 rows of data for individual trees.

Tree ID	Species Name	Leaf Area (m ²)	Potential Evapotranspiration (m ³ /yr)	Evaporation (m ³ /yr)	Transpiration (m ³ /yr)	Water Intercepted (m ³ /yr)	Avoided Runoff (m ³ /yr)
1	Ulmus americana	1,962.0	147.4	16.6	54.8	16.7	3.3
2	Ulmus americana	1,688.1	126.8	14.3	47.2	14.3	2.8
3	Ulmus americana	2,034.2	152.8	17.2	56.8	17.3	3.4
4	Ginkgo biloba	255.6	19.2	2.2	7.1	2.2	0.4
5	Ginkgo biloba	356.3	26.8	3.0	10.0	3.0	0.6
6	Ulmus americana	699.8	52.6	5.9	19.6	5.9	1.2
7	Fraxinus americana 'Autumn Purple'	214.5	16.1	1.8	6.0	1.8	0.4
8	Quercus bicolor	216.8	16.3	1.8	6.1	1.8	0.4

Use i-Tree Eco ...

- ... when you have existing data
- ... when you have resources for a large-scale project
- ... if you can make good use of the wealth of results
- ... to support management
- ... when interested in a plot-based sample
- ... for centralized project management

Try another i-Tree tool ...

- ... when working with students or the public
- ... to show that trees have benefits
- ... when time is limited
- ... to start conversations on trees and tree benefits
- ... when you are interested in canopy cover
- ... for priority planning



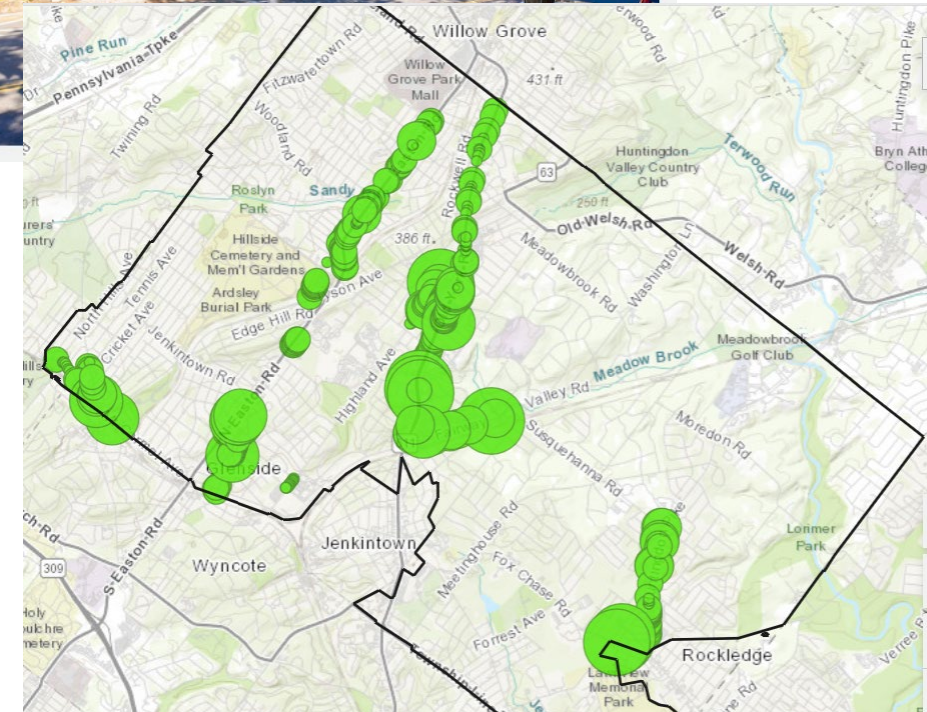
i-Tree Eco is flexible

Test your decisions with a pilot project!

A pilot project is a small project designed using the set-up you are considering for a larger project.

- Test assumptions and methods
- Evaluate challenges and limitations
- Can be expanded to become your target project

Street Trees & Our Business Districts



Additional resources – project planning



Project Management

[Idaho Treasure Valley i-Tree Eco Project Management Report](#) - This document developed by David Stephenson, Idaho Department of Lands Community Forestry Program, provides suggestions, methods, tips and tools to help future Eco project managers.

[Eco Project Cost Estimation](#) - This document, developed by Eric Kuehler from Urban Forestry South, offers a cost estimate for an Eco project. Note - Numerous factors can affect project cost and this is provided only as a general guideline.

[Eco Project Time Estimation](#) - This document, developed by Eric Kuehler from Urban Forestry South, provides time estimations for planning and conducting an Eco project.

[Eco Project Timeline](#) - This document, developed by Eric Kuehler from Urban Forestry South, is an example of a Eco project time line for a county assessment.

[Eco Project Equipment List](#) - This is an example of equipment options for a typical i-Tree Eco project.

[Eco Report Explanation Brief](#) - This document, developed by Eric Kuehler, USFS Urban Forestry South, and Francisco Escobedo, University of Florida, provides a brief explanation of and uses for the i-Tree Eco reports.

[City of Milwaukee - Notification Letter](#) - This is an example on an access notification letter sent to residents provided courtesy of the City of Milwaukee.

[City of Milwaukee - Access Response Card](#) - This is an example on an Eco plot access response card sent to residents provided courtesy of the City of Milwaukee.

Data Collection Guides

[Eco Field Data Cheat Sheet \(1 page field resource\) updated 03.28.2021](#) - (16MB pdf) This two-page guide is great to have in the field for inexperienced crews or when you need a reminder of how to collect Eco data and measurements for a given tree. This document was developed by Naomi Zurcher of Arbor Aegis in support of the Swiss i-Tree Eco project.

[Casey Trees UFORE Management Guide](#) - This guide, which was developed by Casey Trees in Washington D.C., provides detailed guidelines for planning, managing and executing an i-Tree Eco project.

[Cascade Land Conservancy \(CLC\) Integrated Forest Assessment Report](#) - This document was developed by CLC in Seattle, WA, and describes outreach efforts and guidelines for planning and managing Eco plot access issues.

[Eco plot descriptions Powerpoint \(PDF\)](#) - This is a PDF file of a PowerPoint used for Eco plot training developed courtesy of Keith Sacre from Treeconomics

[Eco Data Explanation Sheet](#) - Brief description of Eco sample project plot & tree data collection options.



Additional resources - videos

Eco Basics, Project Creation, and External Import Steps

[Eco v6 highlights and overview - 5 min.](#) - video highlights features and options in the i-Tree Eco v6 application.

[Importing external inventory data into Eco v6 - 8 min.](#) - Instructions for setting up an Eco v6 inventory project and importing in external data.

[Eco v6 sample project creation - 8 min.](#) - Creating a plot-based sample project using the i-Tree Eco v6 application.

[Eco v6 complete inventory project creation - 11 min.](#) - Creating a complete inventory project using the i-Tree Eco v6 application.

Eco Plot Establishment

[Basic Eco sample plot establishment - 2 min.](#) - How to lay out a simple 1/10th acre plot for an Eco sample project.

[Eco wooded plot establishment - 3 min.](#) - How to lay out an Eco sample plot partially in a wooded area.

[Measuring plot reference object - 2 min.](#) - How to measure a reference or permanent object from an established eco plot center.

Eco Tree Measurements

[i-Tree Eco - Basic tree height measurements - 9 min.](#) - How to measure total tree height, height to live top, and height to crown base

[Simple tree DBH measurement - 2 min.](#) - How to measure a single stem tree (DBH) diameter at breast height.

[CLE - Crown Light Exposure - 3 min.](#) - How to determine the crown light exposure (CLE) for a tree during Eco field data collection

Using the i-Tree Eco v6 Mobile Data Collection (MDC) system

[Mobile Data Collection part 1 - How To Submit A Project To A Mobile Device - 5 min.](#) - In this video there are instructions concerning how to submit i-Tree Eco inventory and plot-based projects to the mobile data collector.

[Mobile Data Collection part 2 - How To Collect Data With The Mobile Data Collector - 8 min.](#) - In this video there are instructions concerning how to collect data with the mobile data collector for i-Tree Eco inventory and plot-based projects.

[Mobile Data Collection part 3 - Retrieving Data - 3 min.](#) - In this video there are instructions concerning how to retrieve data that has been collected using the mobile data collector for i-Tree Eco inventory and plot-based projects.

[Mobile Data Collection Project Management Tips - 3 min.](#) - This video is supplemental to the three-part series concerning the mobile data collector. In this video there are examples of, and solutions to, the sticking points we are aware of users encountering while using the mobile data collector.

[Mobile Data Collection: Recording coordinates for plot center or tree locations- 3 min.](#) - This video demonstrates using the Eco v6 Mobile Data Collection (MDC) system options for recording plot center or tree locations.