Winter 2025

i-Tree International Academy

DAVEY Institute
A Division of The Davey Tree Expert Company

Winter 2025

i-Tree International Academy

Helpful guidelines for this session:

- Please mute your audio during presentations
- Use chat window for comments and questions
- Please be patient – we will try to answer all questions

i-Tree website:

- *www.itreetools.org*

i-Tree Support email:

- *info@itreetools.org*

A Division of The Davey Tree Expert Company

Winter 2025

i-Tree International Academy

Meet the i-Tree Team!

Liza Paqueo
USDA Forest Service
International Programs
Washington, DC

Maria Arroyave
USDA Forest Service
International Programs
Columbia

Fabiola Lopez
USDA Forest Service
International Programs
Mexico

Dave Bloniarz
USDA Forest Service
Northern Research Station

Scott Maco
The Davey Institute

Jason Henning
The Davey Institute
USDA Forest Service

Krista Heinlen
The Davey Institute
USDA Forest Service

Ana Castillo
The Davey Institute

Akshat Tyagi
Give Me Trees Trust
India

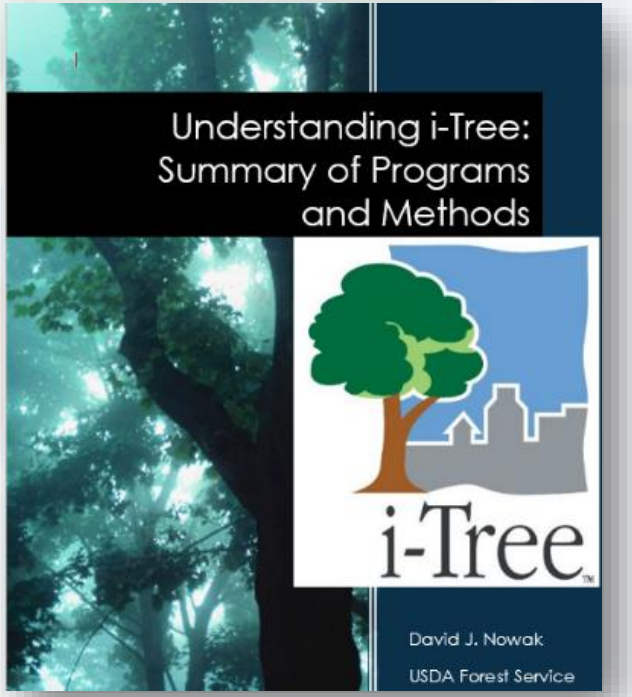
i-Tree website:
- www.itreetools.org

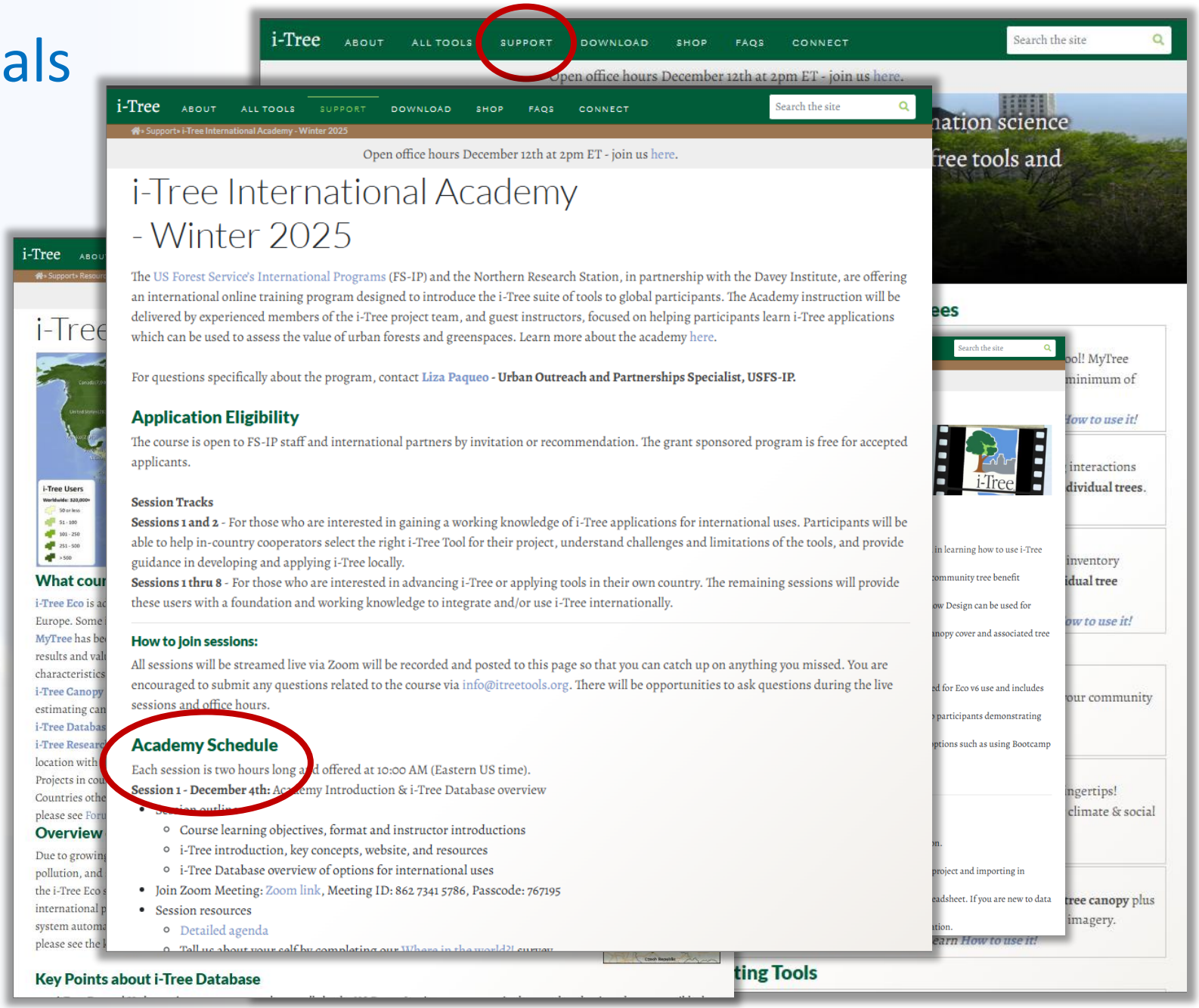
i-Tree Support email:
- info@itreetools.org

Website & Course Materials

www.itreetools.org

- Links for all tools
- Manuals and videos
- International reports





i-Tree Canopy: Estimating Your Coverage Through Image Analysis

Urban Canopy As Community Asset
Tools For Benefits Assessments

Krista Heinlen

Davey Institute/USDA Forest Service

Urban Canopy As Community Asset

- Benefits of Urban Trees
  - Improve air quality and public health
    - *Trees store carbon and filter air pollutants*
  - Mitigate flooding and stormwater concerns
    - *Slowing down rainfall runoff*
  - Reduce energy bills
    - *Shade!*
  - Strengthen ecosystem diversi
    - *Wildlife and pollinators*
  - Build social capital
  - But before you can tell that st

What Do I Have?

Where Do I Have It?

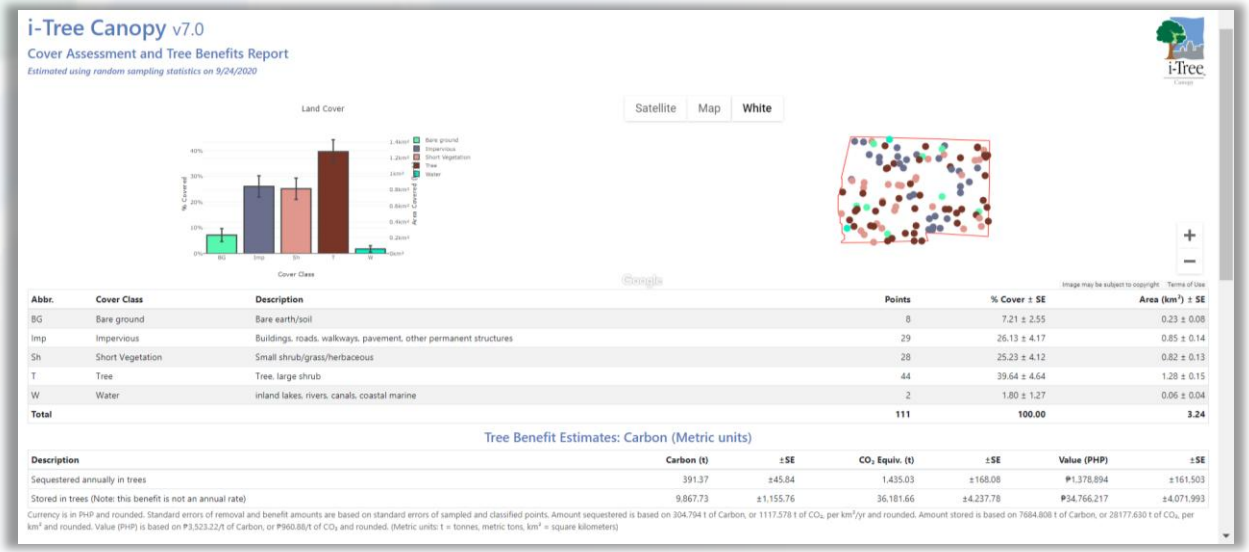
Defining Canopy Assets: Start Simple To See The Big Picture

- i-Tree Canopy
  - Combining the utility of Google with US Forest Service science
  - Available online – no download required!
  - Imagery covers the globe
  - User can assess what's on the ground for desired location…*quickly*

There's a map for that…

Defining Canopy Assets – i-Tree Canopy

- The view from the top
  - Capturing data on land cover *(percent canopy, impervious, and more),* and estimating benefits using aerial imagery
  - Estimate air pollution and carbon benefits of tree canopy, with associated values
  - Ability to measure change over time



i-Tree Canopy v7.0

Cover Assessment and Tree Benefits Report

Estimated using random sampling statistics on 9/24/2020

Land Cover

Satellite | Map | White

Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (km²) ± SE
BG	Bare ground	Bare earth/soil	8	7.21 ± 2.55	0.23 ± 0.08
Imp	Impervious	Buildings, roads, walkways, pavement, other permanent structures	29	26.13 ± 4.17	0.85 ± 0.14
Sh	Short Vegetation	Small shrub/grass/herbaceous	28	25.23 ± 4.12	0.82 ± 0.13
T	Tree	Tree, large shrub	44	39.64 ± 4.64	1.28 ± 0.15
W	Water	inland lakes, rivers, canals, coastal marine	2	1.80 ± 1.27	0.06 ± 0.04
Total			**111**	**100.00**	**3.24**

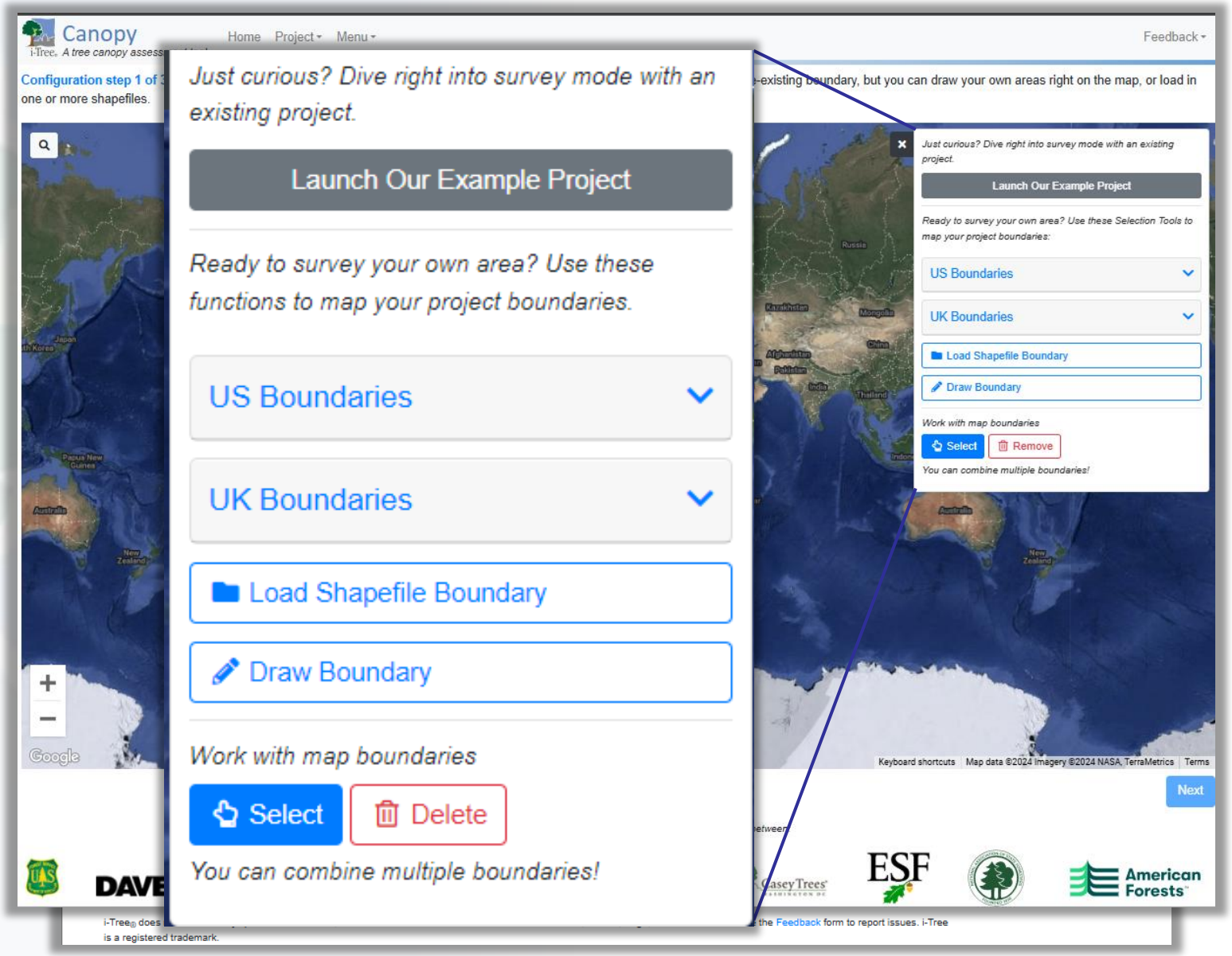
Tree Benefit Estimates: Carbon (Metric units)

Description	Carbon (t)	±SE	CO_2 Equiv. (t)	±SE	Value (PHP)	±SE
Sequestered annually in trees	391.37	±45.84	1,435.03	±168.08	₱1,378,894	±161,503
Stored in trees (Note: this benefit is not an annual rate)	9,867.73	±1,155.76	36,181.66	±4,237.78	₱34,766,217	±4,071,993

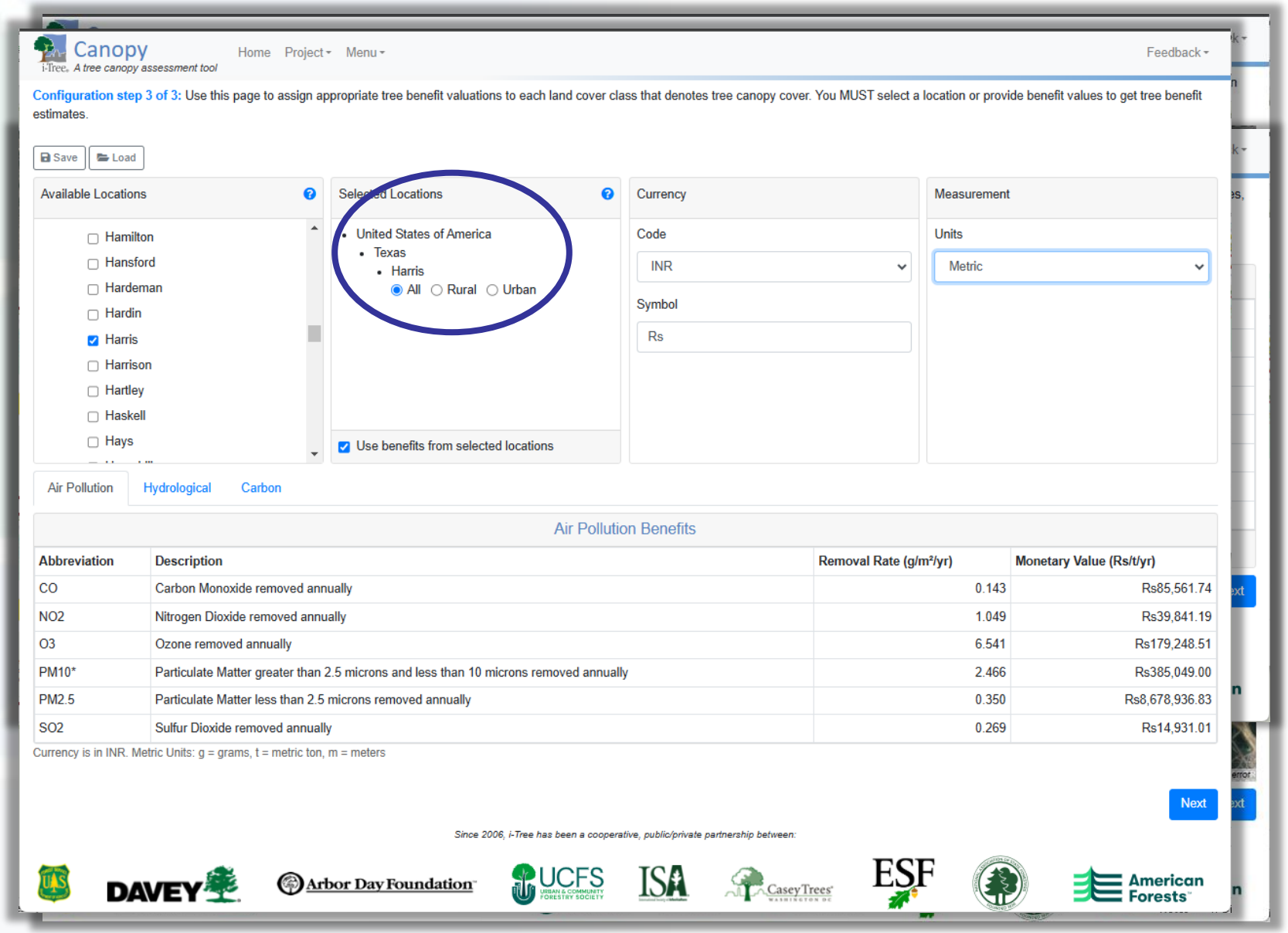
Currency is in PHP and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Amount sequestered is based on 304.794 t of Carbon, or 1117.578 t of CO_2, per km^2/yr and rounded. Amount stored is based on 7684.808 t of Carbon, or 28177.630 t of CO_2, per km^2 and rounded. Value (PHP) is based on ₱3,523.22/t of Carbon, or ₱960.88/t of CO_2 and rounded. (Metric units: t = tonnes, metric tons, km^2 = square kilometers)

Defining Canopy Assets – i-Tree Canopy

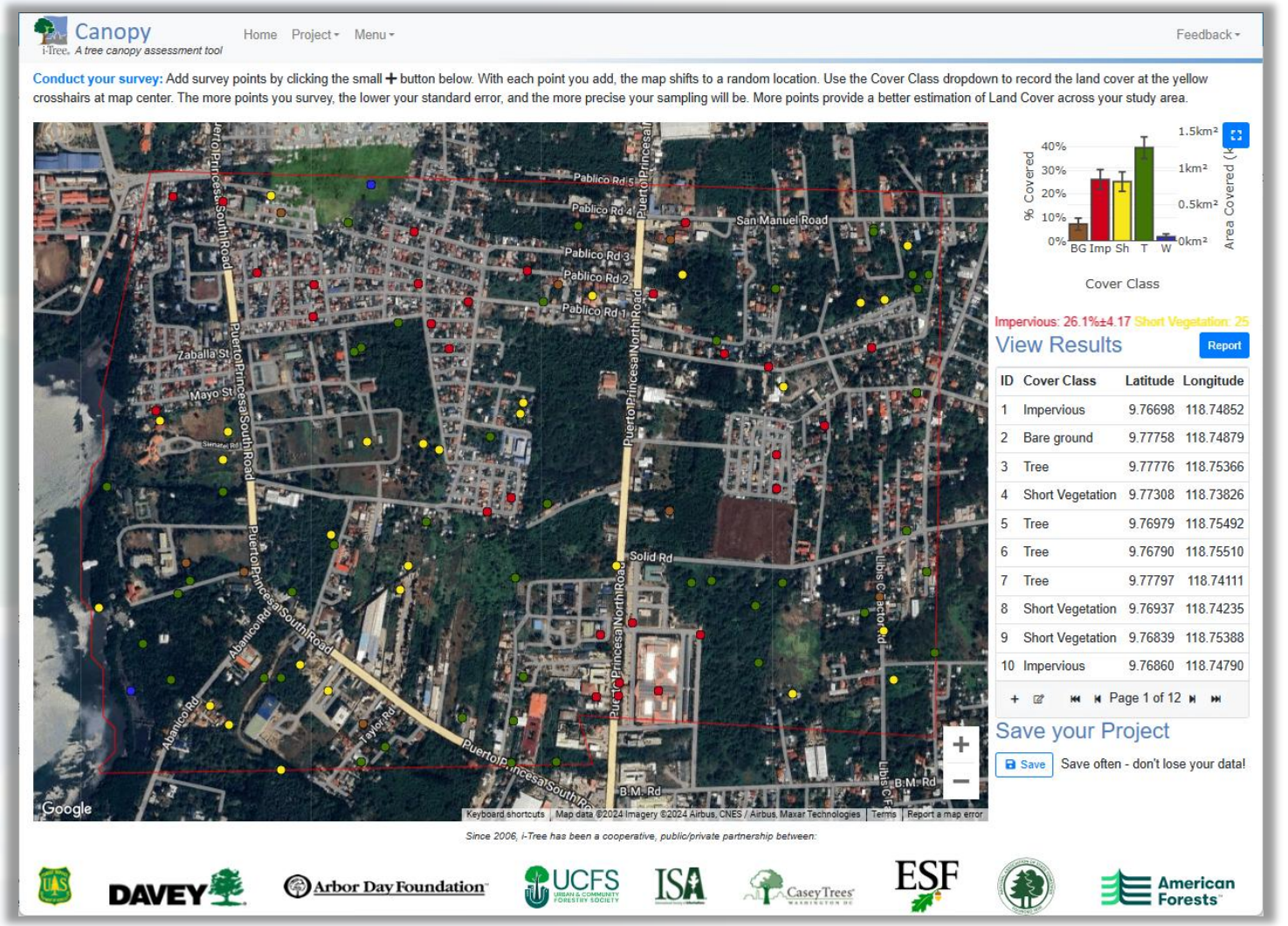
canopy.itreetools.org



Defining Canopy Assets – i-Tree Canopy

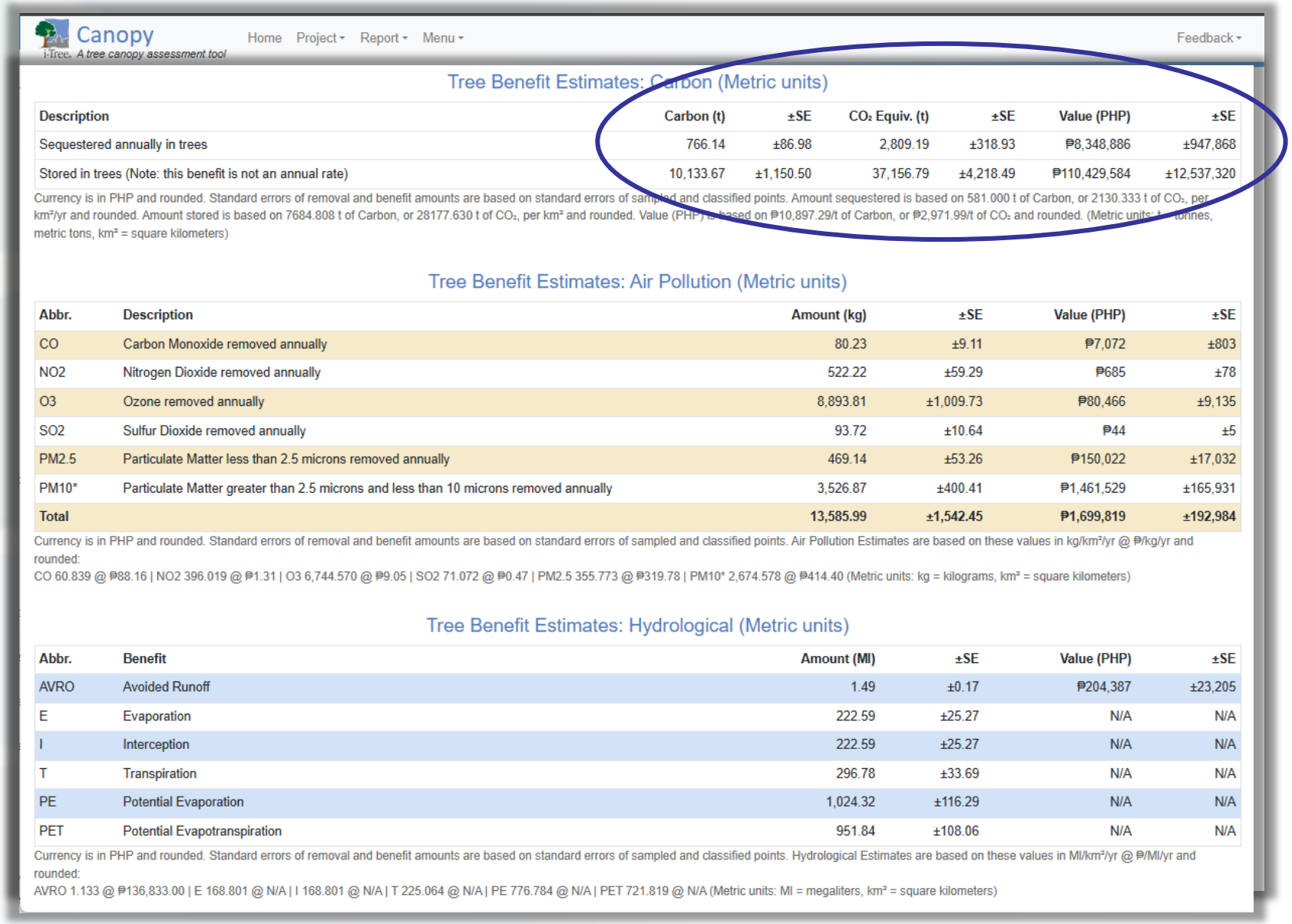


Defining Canopy Assets – i-Tree Canopy



How many points matters…

Defining Canopy Assets – i-Tree Canopy



Canopy
i-Tree. A tree canopy assessment tool

Home Project Report Menu Feedback

Tree Benefit Estimates: Carbon (Metric units)

Description	Carbon (t)	±SE	CO_2 Equiv. (t)	±SE	Value (PHP)	±SE
Sequestered annually in trees	766.14	±86.98	2,809.19	±318.93	₱8,348,886	±947,868
Stored in trees (Note: this benefit is not an annual rate)	10,133.67	±1,150.50	37,156.79	±4,218.49	₱110,429,584	±12,537,320

Currency is in PHP and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Amount sequestered is based on 581.000 t of Carbon, or 2130.333 t of CO_2, per km²/yr and rounded. Amount stored is based on 7684.808 t of Carbon, or 28177.630 t of CO_2, per km² and rounded. Value (PHP) is based on ₱10,897.29/t of Carbon, or ₱2,971.99/t of CO_2 and rounded. (Metric units: t = tonnes, metric tons, km² = square kilometers)

Tree Benefit Estimates: Air Pollution (Metric units)

Abbr.	Description	Amount (kg)	±SE	Value (PHP)	±SE
CO	Carbon Monoxide removed annually	80.23	±9.11	₱7,072	±803
NO2	Nitrogen Dioxide removed annually	522.22	±59.29	₱685	±78
O3	Ozone removed annually	8,893.81	±1,009.73	₱80,466	±9,135
SO2	Sulfur Dioxide removed annually	93.72	±10.64	₱44	±5
PM2.5	Particulate Matter less than 2.5 microns removed annually	469.14	±53.26	₱150,022	±17,032
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	3,526.87	±400.41	₱1,461,529	±165,931
Total		**13,585.99**	**±1,542.45**	**₱1,699,819**	**±192,984**

Currency is in PHP and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Air Pollution Estimates are based on these values in kg/km²/yr @ ₱/kg/yr and rounded:
CO 60.839 @ ₱88.16 | NO2 396.019 @ ₱1.31 | O3 6,744.570 @ ₱9.05 | SO2 71.072 @ ₱0.47 | PM2.5 355.773 @ ₱319.78 | PM10* 2,674.578 @ ₱414.40 (Metric units: kg = kilograms, km² = square kilometers)

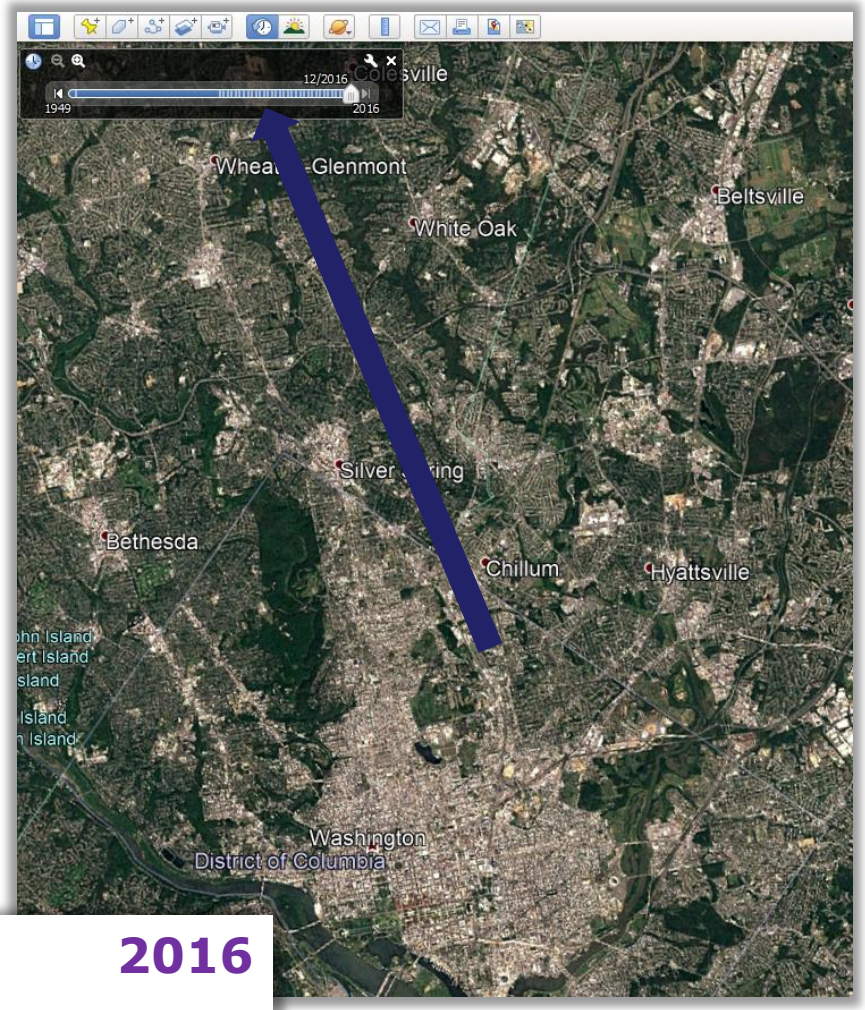
Tree Benefit Estimates: Hydrological (Metric units)

Abbr.	Benefit	Amount (Ml)	±SE	Value (PHP)	±SE
AVRO	Avoided Runoff	1.49	±0.17	₱204,387	±23,205
E	Evaporation	222.59	±25.27	N/A	N/A
I	Interception	222.59	±25.27	N/A	N/A
T	Transpiration	296.78	±33.69	N/A	N/A
PE	Potential Evaporation	1,024.32	±116.29	N/A	N/A
PET	Potential Evapotranspiration	951.84	±108.06	N/A	N/A

Currency is in PHP and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Hydrological Estimates are based on these values in Ml/km²/yr @ ₱/Ml/yr and rounded:
AVRO 1.133 @ ₱136,833.00 | E 168.801 @ N/A | I 168.801 @ N/A | T 225.064 @ N/A | PE 776.784 @ N/A | PET 721.819 @ N/A (Metric units: Ml = megaliters, km² = square kilometers)

Canopy Change Over Time

- Utilize Google Earth to evaluate trends and projects with historic images
- Use results to track progress, or inform future development

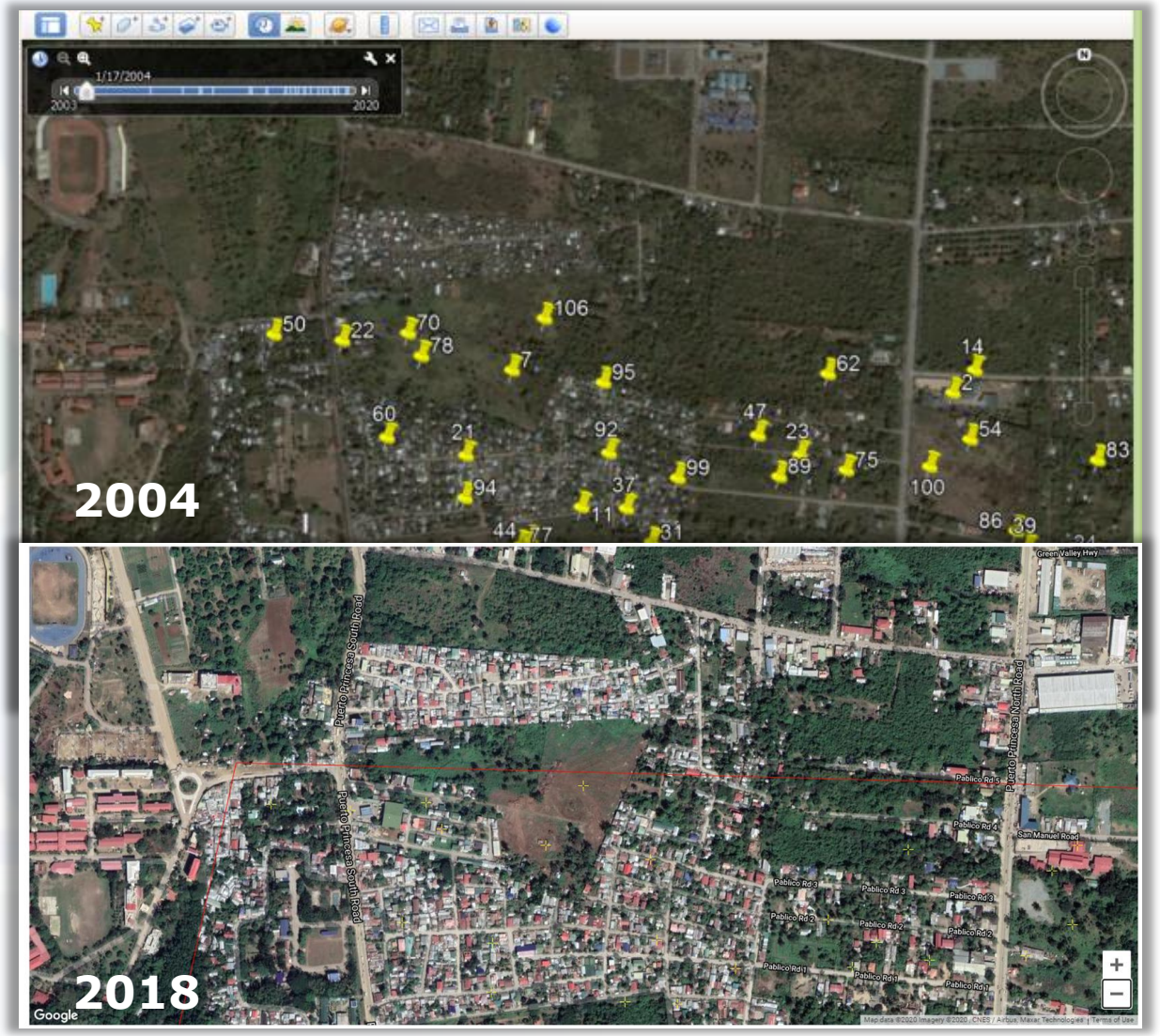


Land Use	2005	2016
Tree	23.0%	23.7% (+)
Impervious	32.1	33.0 (+)
Grass	36.8 (-)	38.4
Bare Ground	4.33	3.83 (-)
Water	2.67 (+)	2.16

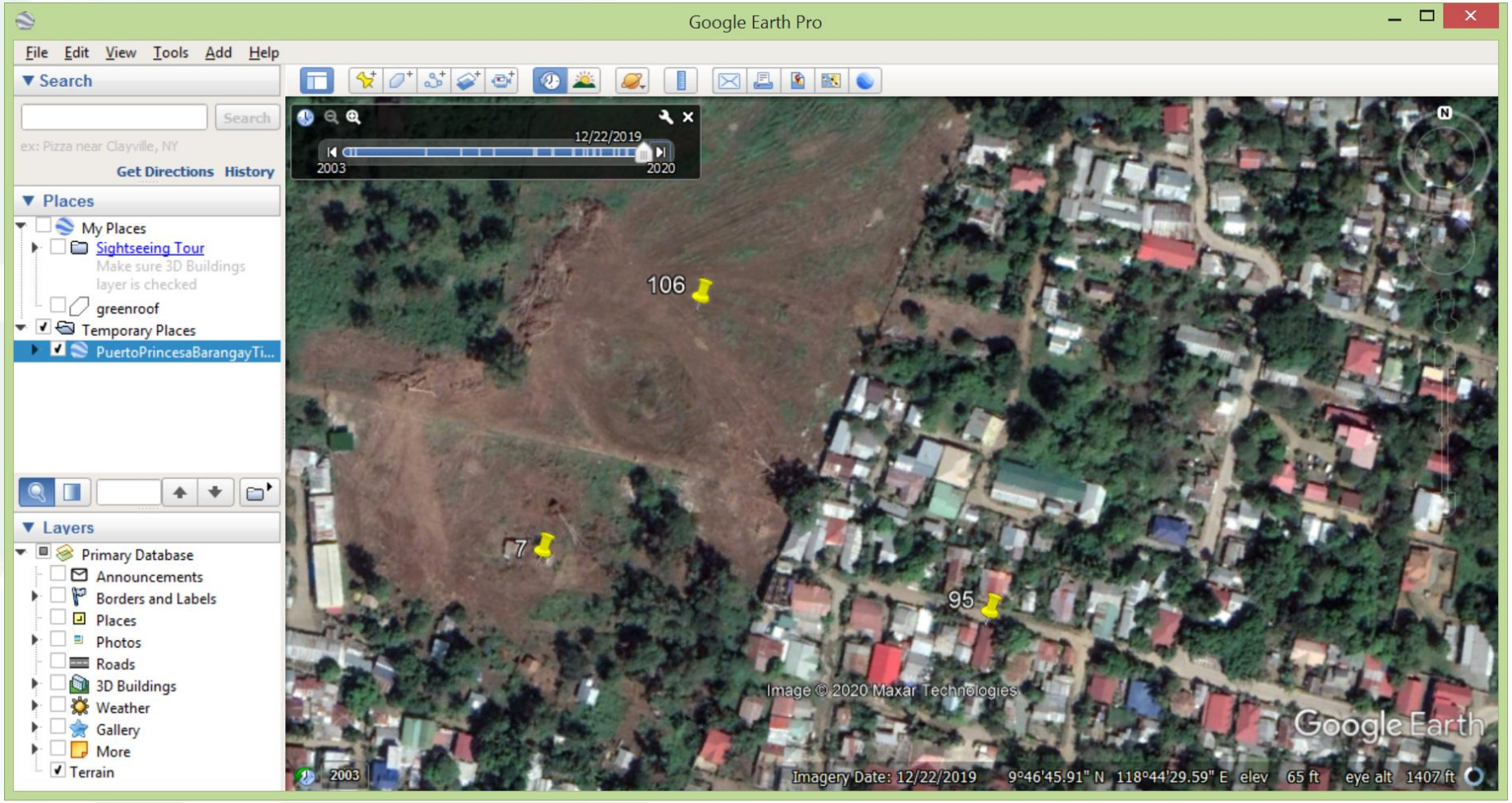
		2016
Air Pollution (+)	$1,313,000	$1,353,000
Stormwater	$710,000	

But know that Google can be tricky…

Canopy Change Over Time



Canopy Change Over Time



Tiniguiban, Puerto Princesa, Philippines

I Have My Canopy Estimates – Now What?

Data is exportable…and unbound!

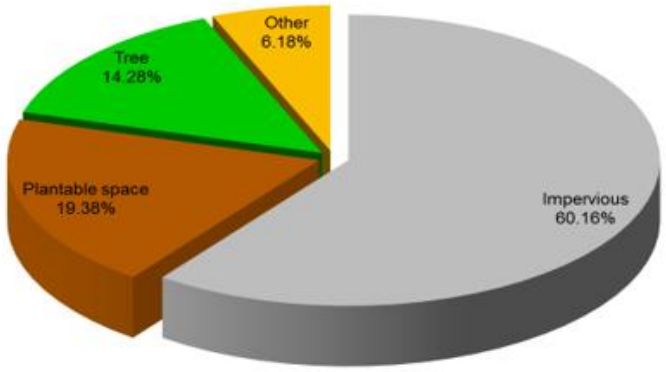
Example i-Tree Canopy Projects

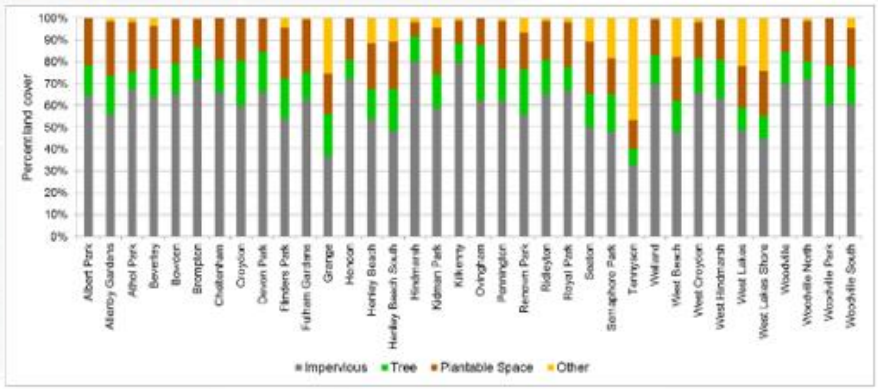
seed consulting services

City of Charles Sturt (52.14km²)

- 36 suburbs (425 pts)
- 12 land-use categories
- 3 time periods
- 2 tenures (in GIS)

Direct canopy outputs → land cover and use benchmarks across City and suburbs





Impervious
Building 29.32%
Road 10.74%
Other 20.10%

Plantable space
Bare ground 8.56%
Grass - other 10.82%

Tree
Pervious 9.65%
Impervious 4.63%

Other
Grass - sporting 2.33%
Beach 1.86%
Dune vegetation 0.86%
Water 1.00%
Wetland vegetation 0.13%

Seed slides and analyses courtesy of Jenni Garden, Adelaide, SA, AU

I Have My Canopy Estimates – Now What?

Example i-Tree Ca

Survey revealed that while canopy cover had declined across the whole city, it had actually increased in public land through planting programs, but this increase had been outpaced by declines on private land due to urbanization

DAVEY
Proven Solutions for a Growing World

Estimates of Your Tree Benefits

More than an investment in beauty and shade, your trees work hard for you!

Prepared exclusively for: South Bend, IN

Estimated Tree Cover for your City: 23.7%

Estimated Land Cover	acres
Tree	6,326.8
Impervious	8,809.5
Grass	9,823.9
Bare Earth	1,022.4
Water	712.7
Total	26,695.3

Storm water runoff avoided each year by your trees:
106,111,924 gallons @ $944,396

Carbon Dioxide absorbed each year by your trees:
25,961 tons @ $915,276

Carbon Dioxide already stored in your trees:
798,570 tons @ $28,153,880

Air pollution removed each year by your trees:

	tons	@ value
Carbon Monoxide	5.28	$7,015
Nitrogen Dioxide	19.90	$8,586
Ozone	125.42	$299,050
Sulfur Dioxide	12.41	$1,793
Particulate matter (less than 2.5 microns)	8.55	$817,867
Particulate matter (2.5 to 10 microns)	34.98	$218,527
Total Pollutants	206.54	$1,352,838

Trees remove pollutants from the air.
Poor air quality is a common problem in many urban areas. It can lead to health problems, landscape damage, degraded ecosystems, and reduced visibility.

- *Carbon monoxide (CO)* interferes with oxygen delivery within the human body.
- *Nitrogen dioxide (NO_2)* contributes to ozone and fine particle pollution and is linked to adverse respiratory system effects.
- *Ozone (O_3)* is harmful near the ground and can worsen lung diseases such as asthma, particularly in children.
- *Particulate matter (PM)*, or particle pollution, is a complex mixture of extremely small particles and liquid droplets that can cause serious health effects.
- *Sulfur Dioxide (SO_2)* can make breathing difficult. It contributes to acid rain and can react with other compounds in the atmosphere to form visibility-reducing haze.

Trees absorb carbon dioxide from the air and store it as wood.
Carbon dioxide (CO_2) is a greenhouse gas that traps heat in the atmosphere.

- It enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement).

In addition, your trees:

- Enhance property values
- Improve health and well-being
- Reduce storm water runoff
- Lower summer air temperatures
- Provide wildlife habitat
- Provide aesthetic benefits

I Have My Canopy Estimates – Now What?

- What you know powers the way forward
  - ***What You Have, Where You Have It***
- Stormwater/Urban Heat impact → Impervious just as important as Canopy
- Results can drive conversations with communities
  - Opportunities for input, engagement, and stewardship
  - What do you have, where do you have it, how can you use that knowledge to impact policy and manage resources

- ***Strategies that can build resilience for both trees and neighborhoods***

i-Tree Canopy: Estimating Your Coverage Through Image Analysis

Questions?

canopy.itreetools.org

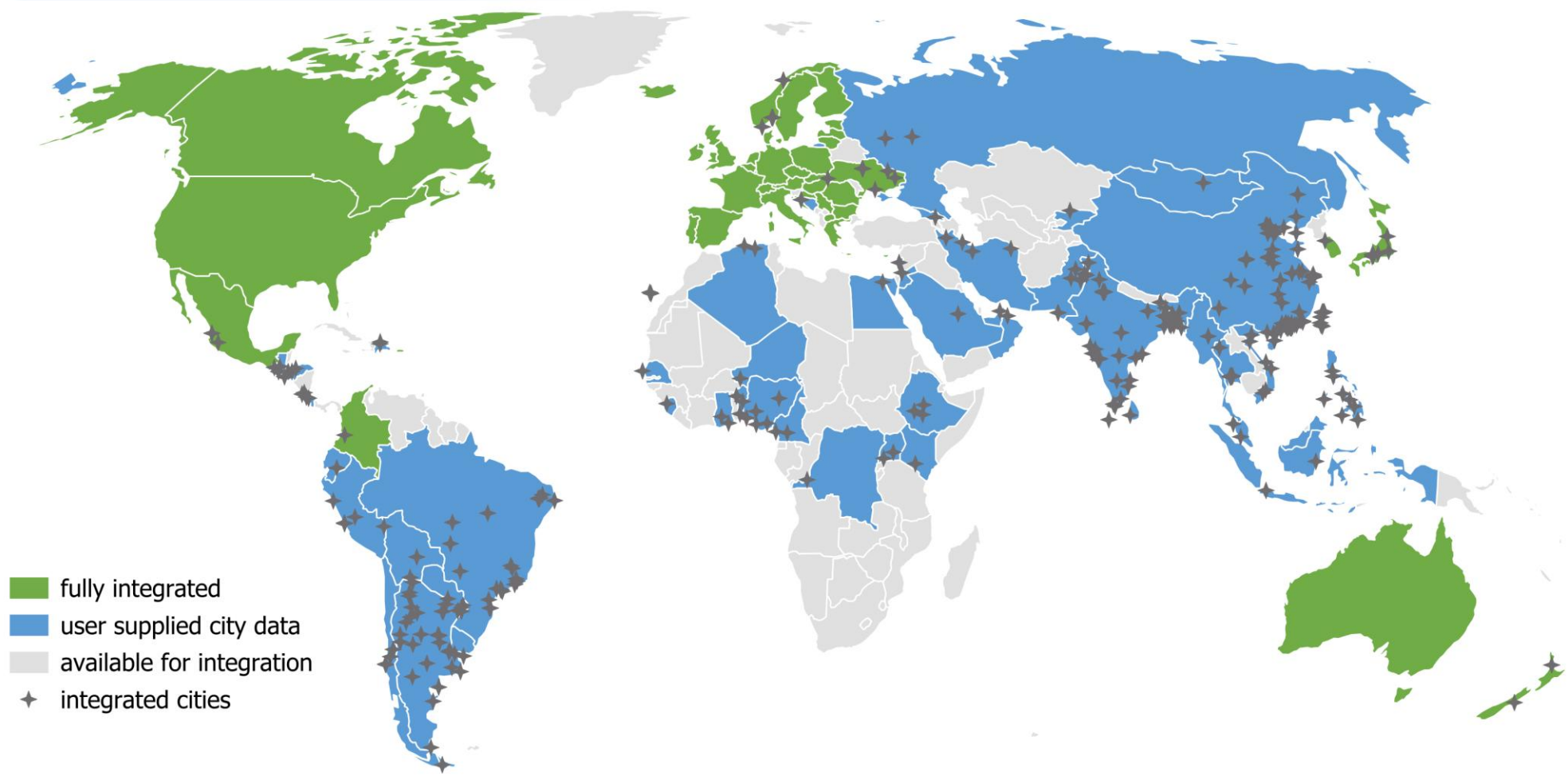
i-Tree International Academy 2024
Session 2
i-Tree Eco Overview

i-Tree Eco Global Availability

Whole country integrations

- Australia
- Canada
- Colombia
- Europe
- Mexico
- South Korea
- New Zealand
- Ukraine Japan

Over 400 Single cities integrated through i-Tree Database



[i-Tree Database]

[International Use of i-Tree]

i-Tree Eco: Maximum flexibility and detail

Flexible

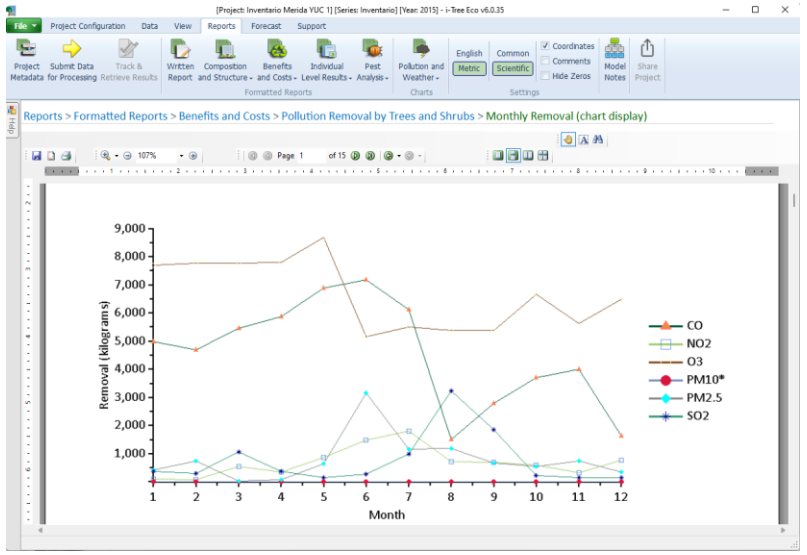
- Scale – individual tree to city
- Inputs
- Data capture methods
- Forecasting

Detailed

- Tree measurements
- Local data selection
- Reports – Over 75 structure and benefits reports
- 20+ page written report

Widest range of applications

Use when you have resources to make the best use of flexibility and detail



Who is using Eco?

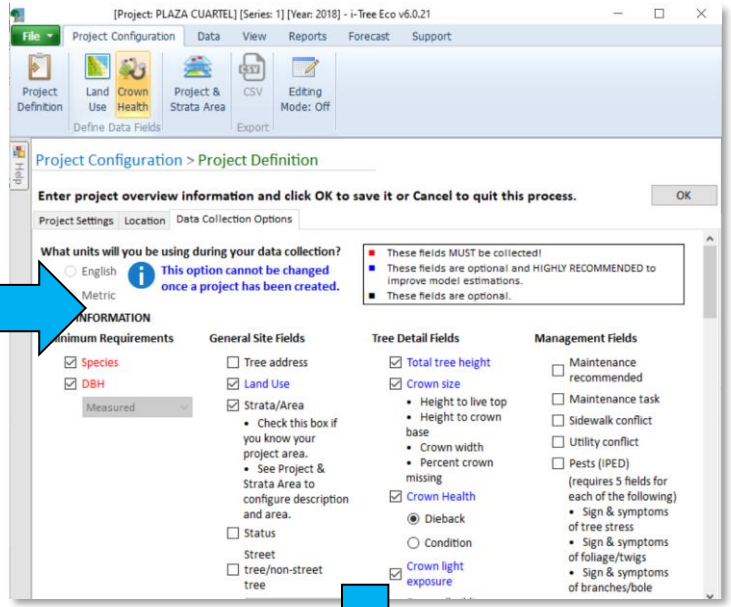
- Governments
- Non-government organizations (NGOs)
- Consulting firms
- Universities & campuses
- Parks and public gardens
- Sustainability programs
- Innovators

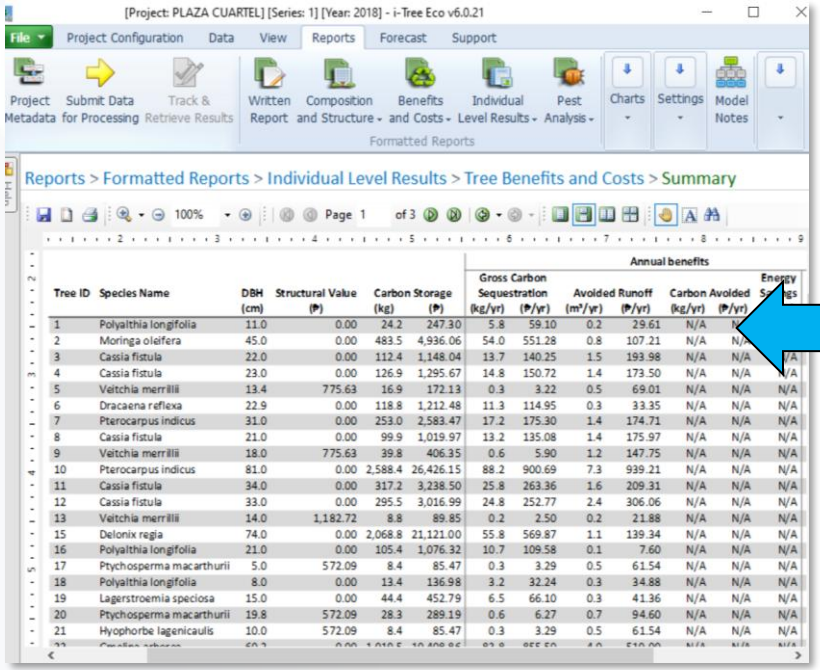
Puerto Princesa City
City Environment & Natural Resources Office
CommuniAct PROGRAM
iTree Eco Application

Palawan Daily News

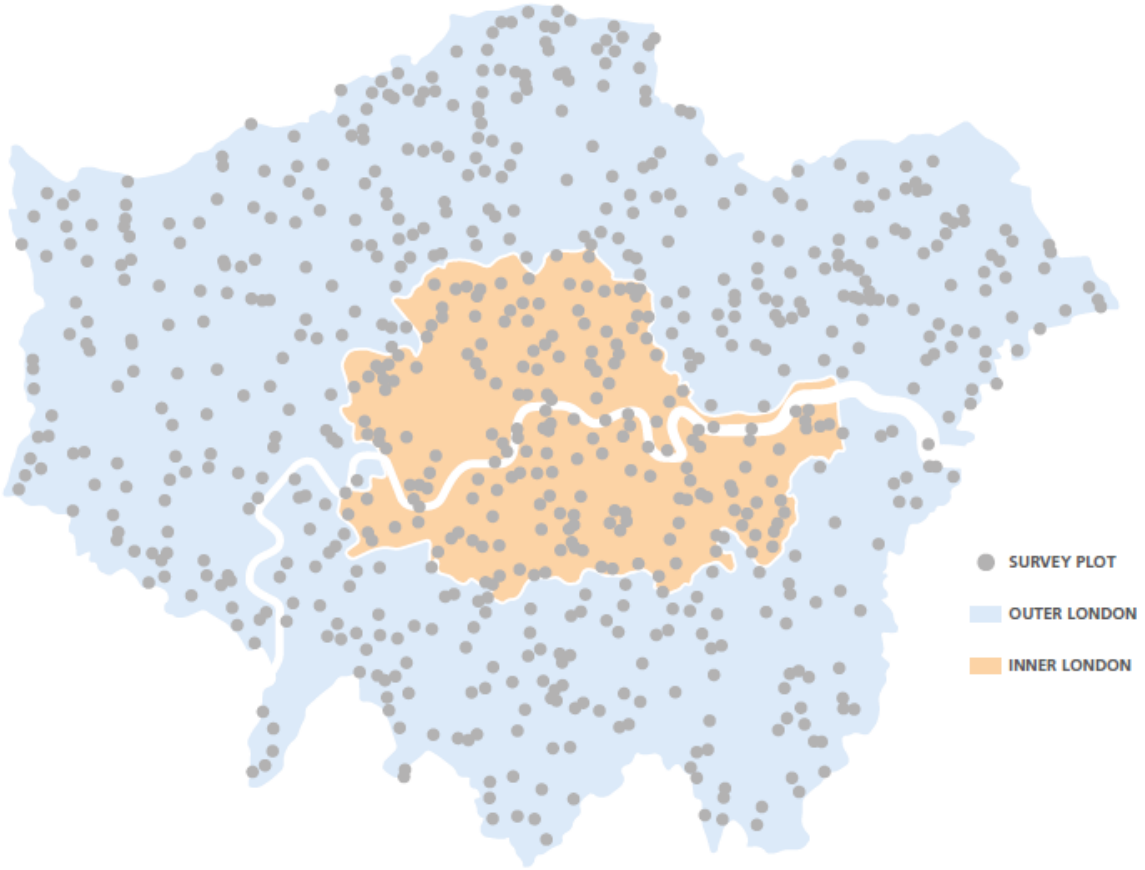
What does an i-Tree Eco project look like?

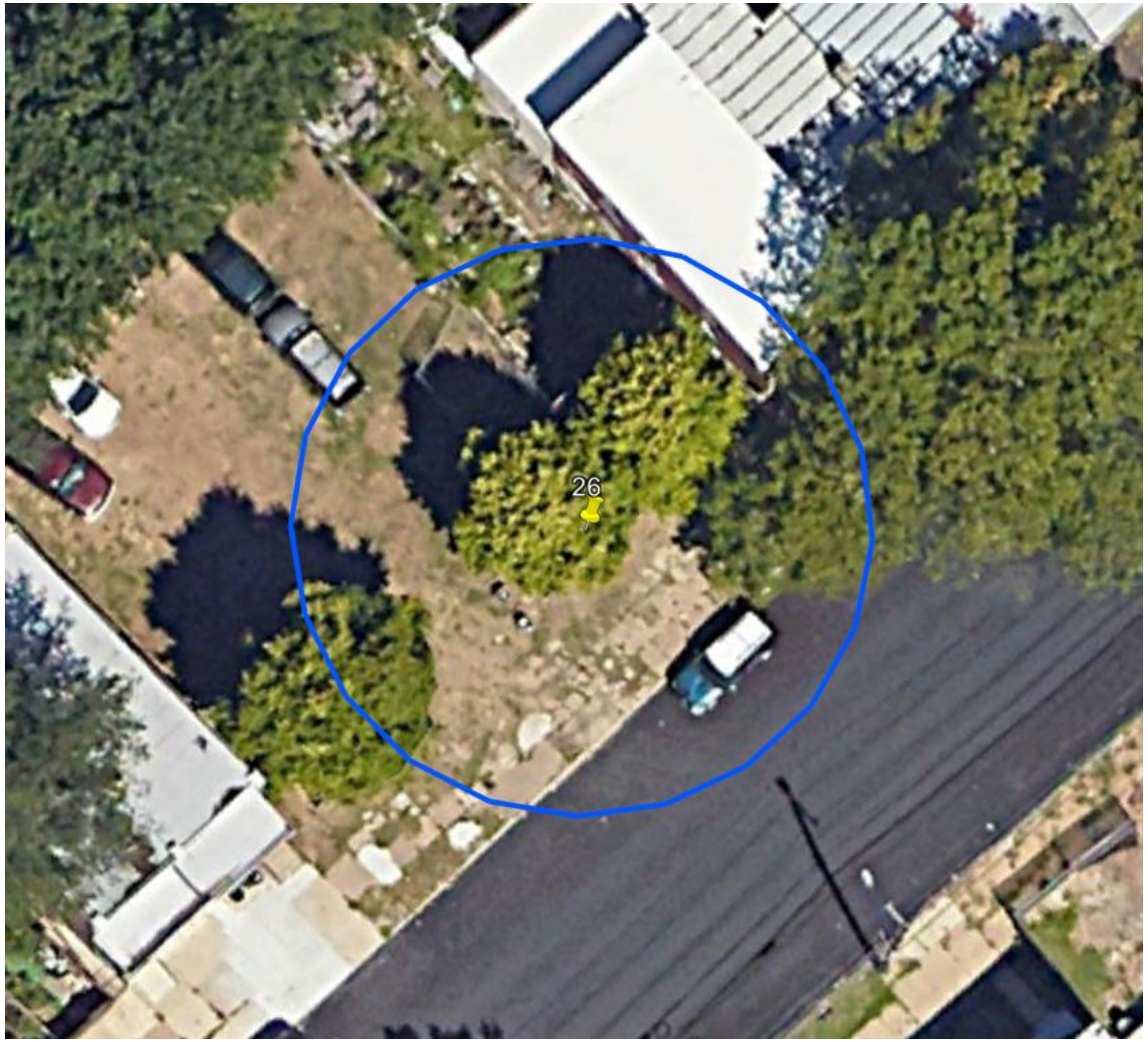
1. Project planning
2. Project set-up and configuration
3. Data collection/Data Import
4. Processing, Results and Reporting





Flexible scale: Plot-base statistical sample





This is how London measures 8.5 million trees

https://www.itreetools.org/support/resources-overview/project-profiles/valuing-londons-urban-forest

Flexible scale: Individual tree inventory

THE ECOLOGICAL BENEFITS OF TREES ON AN URBAN UNIVERSITY CAMPUS

Corinne G. Bassett

Master of Environmental Studies
Environmental Biology

Fall 2015

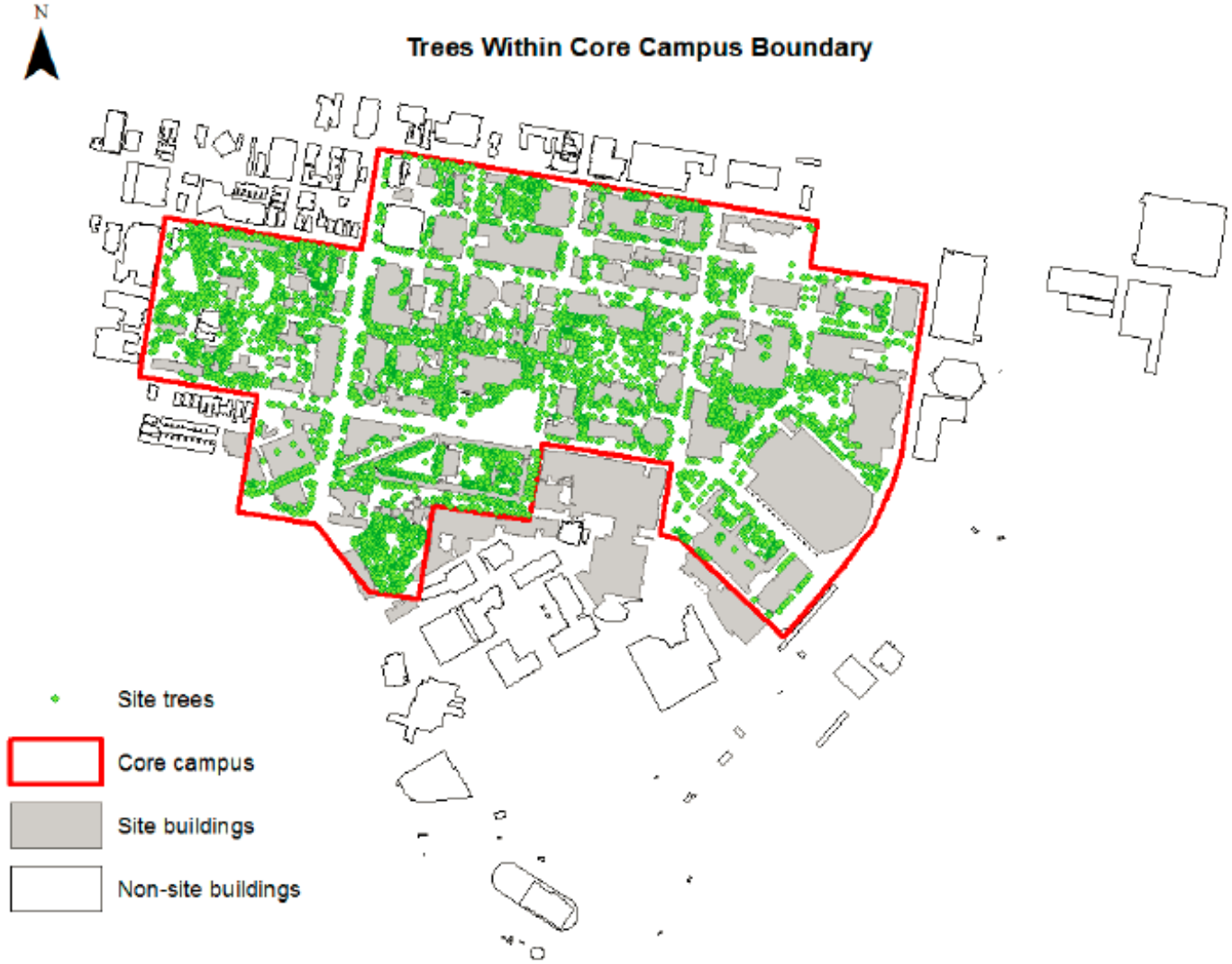
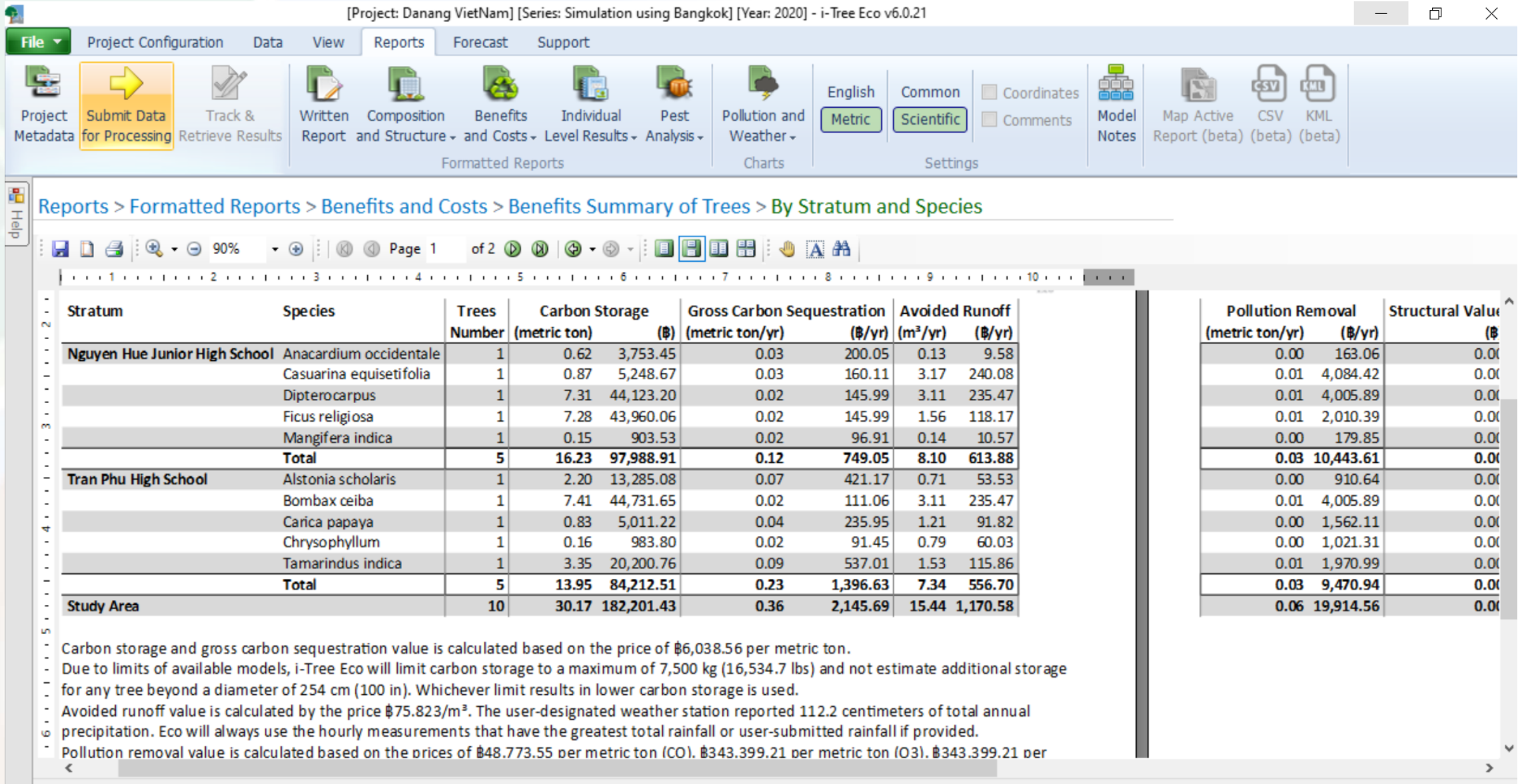


Figure 2: Core campus boundary used in USDA Forest Service study and i-Tree Eco study.

http://repository.upenn.edu/mes_capstones/66/

Flexible scale stratification: Separate project area into parts

Stratification and Location Coordinate Capture for External Mapping



Stratum	Species	Trees Number	Carbon Storage (metric ton)	Carbon Storage (฿)	Gross Carbon Sequestration (metric ton/yr)	Gross Carbon Sequestration (฿/yr)	Avoided Runoff (m³/yr)	Avoided Runoff (฿/yr)	Pollution Removal (metric ton/yr)	Pollution Removal (฿/yr)	Structural Value (฿
Nguyen Hue Junior High School	Anacardium occidentale	1	0.62	3,753.45	0.03	200.05	0.13	9.58	0.00	163.06	0.0
	Casuarina equisetifolia	1	0.87	5,248.67	0.03	160.11	3.17	240.08	0.01	4,084.42	0.0
	Dipterocarpus	1	7.31	44,123.20	0.02	145.99	3.11	235.47	0.01	4,005.89	0.0
	Ficus religiosa	1	7.28	43,960.06	0.02	145.99	1.56	118.17	0.01	2,010.39	0.0
	Mangifera indica	1	0.15	903.53	0.02	96.91	0.14	10.57	0.00	179.85	0.0
	Total	**5**	**16.23**	**97,988.91**	**0.12**	**749.05**	**8.10**	**613.88**	**0.03**	**10,443.61**	**0.0**
Tran Phu High School	Alstonia scholaris	1	2.20	13,285.08	0.07	421.17	0.71	53.53	0.00	910.64	0.0
	Bombax ceiba	1	7.41	44,731.65	0.02	111.06	3.11	235.47	0.01	4,005.89	0.0
	Carica papaya	1	0.83	5,011.22	0.04	235.95	1.21	91.82	0.00	1,562.11	0.0
	Chrysophyllum	1	0.16	983.80	0.02	91.45	0.79	60.03	0.00	1,021.31	0.0
	Tamarindus indica	1	3.35	20,200.76	0.09	537.01	1.53	115.86	0.01	1,970.99	0.0
	Total	**5**	**13.95**	**84,212.51**	**0.23**	**1,396.63**	**7.34**	**556.70**	**0.03**	**9,470.94**	**0.0**
Study Area		**10**	**30.17**	**182,201.43**	**0.36**	**2,145.69**	**15.44**	**1,170.58**	**0.06**	**19,914.56**	**0.0**

Carbon storage and gross carbon sequestration value is calculated based on the price of ฿6,038.56 per metric ton.
Due to limits of available models, i-Tree Eco will limit carbon storage to a maximum of 7,500 kg (16,534.7 lbs) and not estimate additional storage for any tree beyond a diameter of 254 cm (100 in). Whichever limit results in lower carbon storage is used.
Avoided runoff value is calculated by the price ฿75.823/m³. The user-designated weather station reported 112.2 centimeters of total annual precipitation. Eco will always use the hourly measurements that have the greatest total rainfall or user-submitted rainfall if provided.
Pollution removal value is calculated based on the prices of ฿48,773.55 per metric ton (CO), ฿343,399.21 per metric ton (O3), ฿343,399.21 per

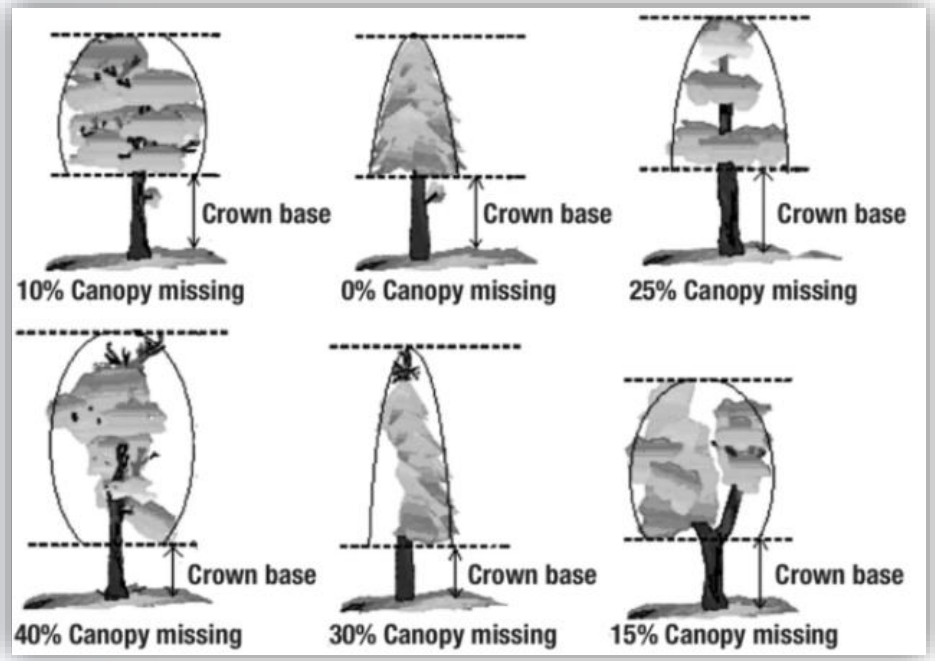
Flexible and Detailed inputs: What data will you collect?

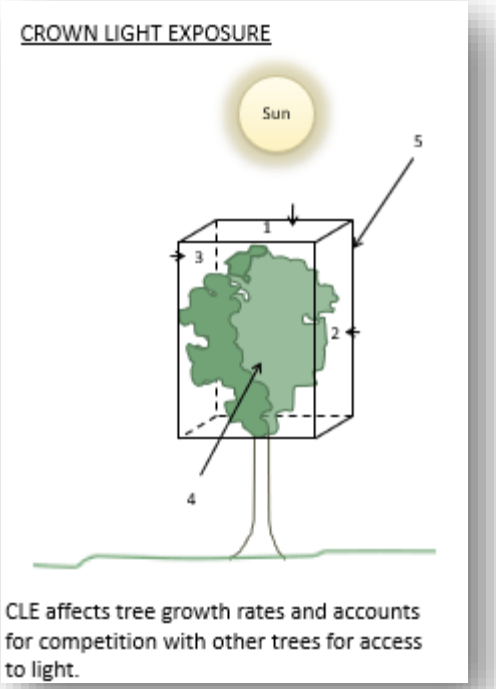
Minimum Required Tree Data

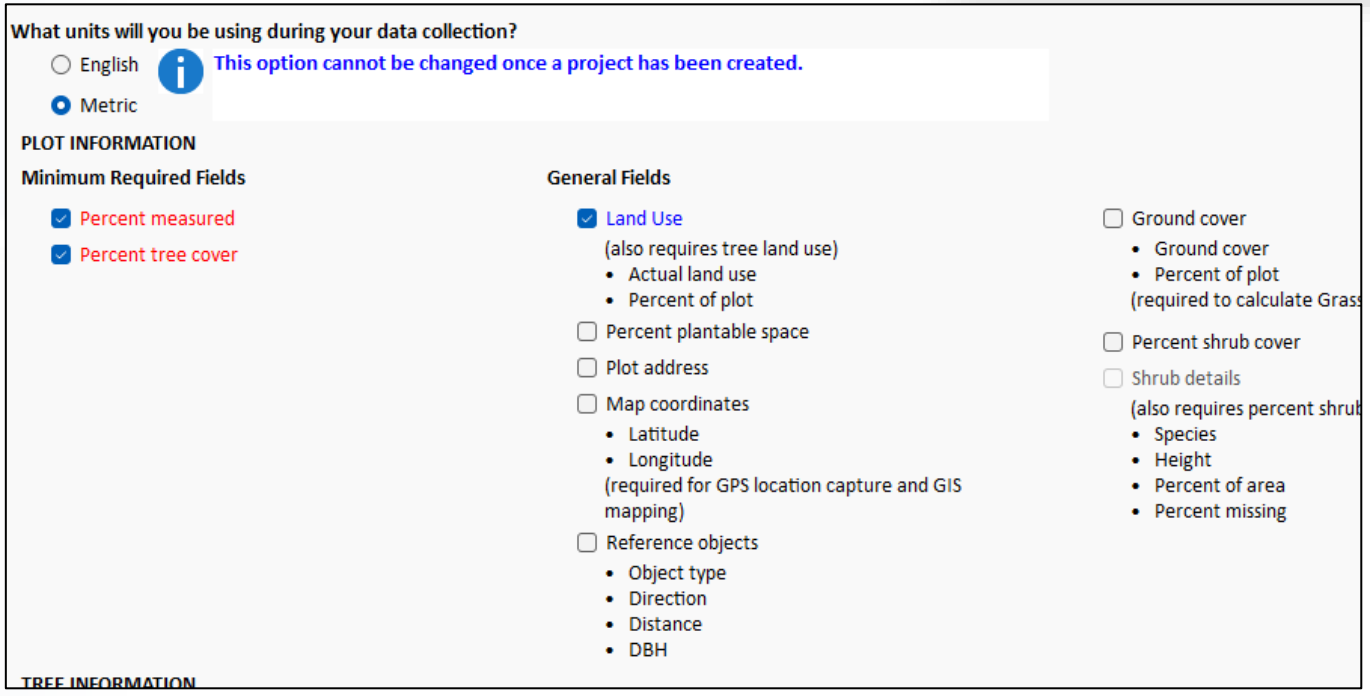
1. Tree species
2. Diameter at breast height (DBH)

<u>Optional</u> but Recommended Tree Data

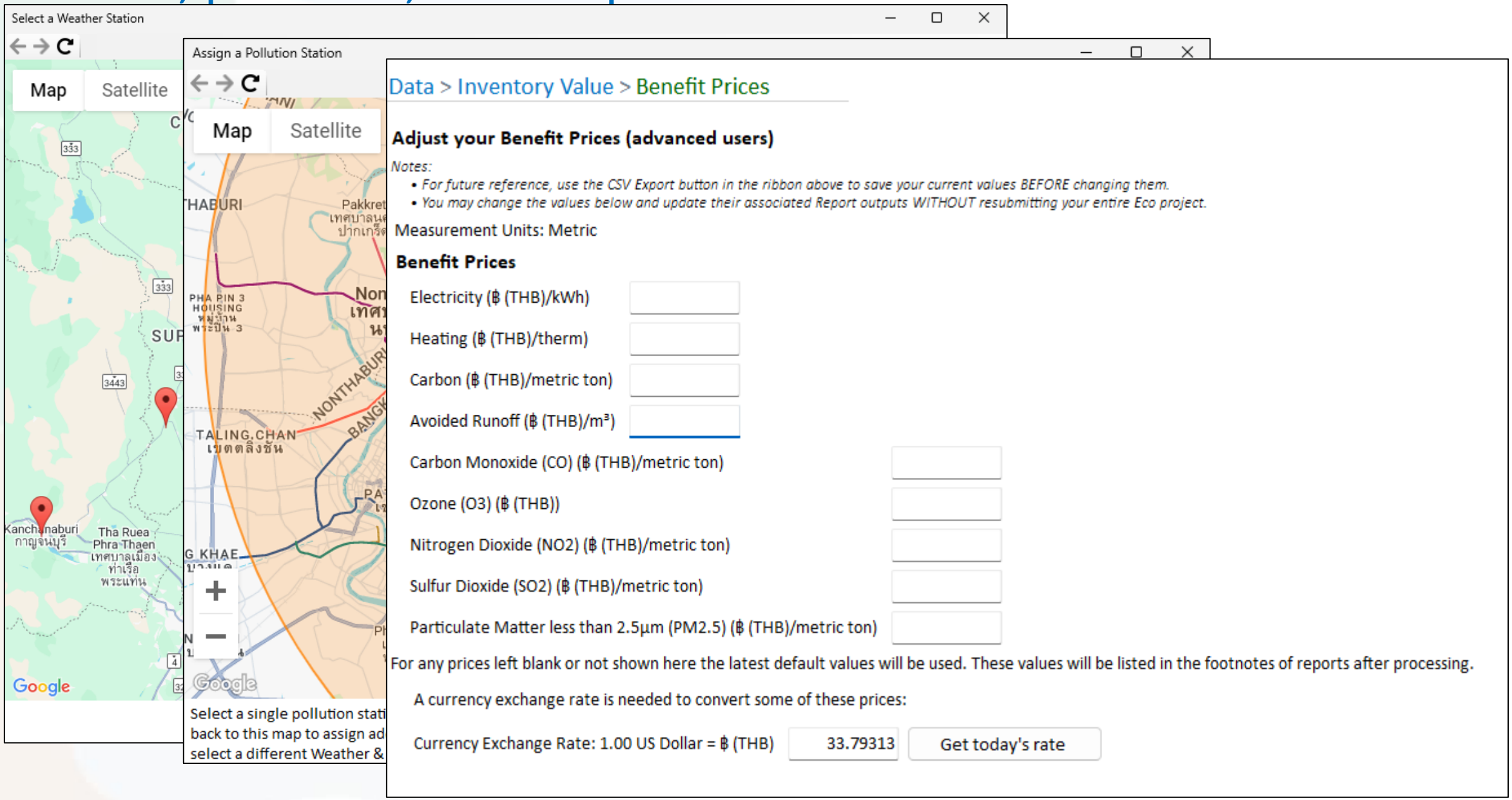
3. Total tree height
4. Height to live top
5. Height to crown base
6. Crown width (N-S)
7. Crown width (E-W)
8. % Crown missing
9. % dieback (condition)
10. Crown light exposure (CLE)
11. Land use





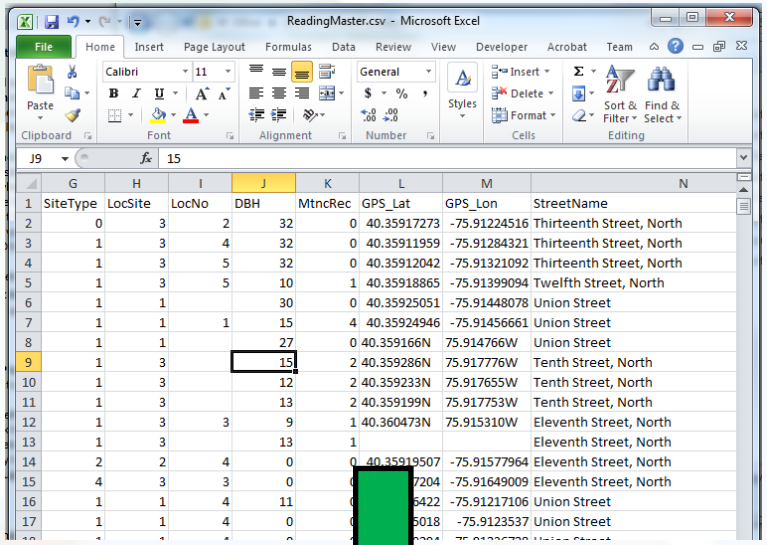


Flexible and detailed local customization: Weather, pollution, benefit prices

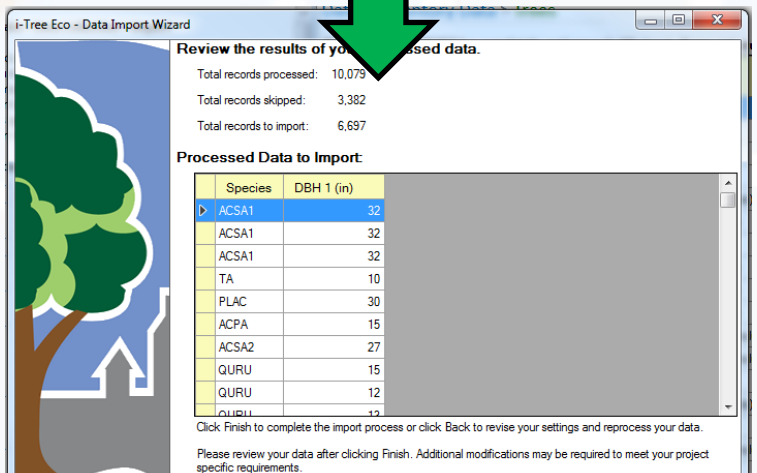


Flexible data capture

Simplified plot or inventory import



	G	H	I	J	K	L	M	N
1	SiteType	LocSite	LocNo	DBH	MtncRec	GPS_Lat	GPS_Lon	StreetName
2	0	3	2	32	0	40.35917273	-75.91224516	Thirteenth Street, North
3	1	3	4	32	0	40.35911959	-75.91284321	Thirteenth Street, North
4	1	3	5	32	0	40.35912042	-75.91321092	Thirteenth Street, North
5	1	3	5	10	1	40.35918865	-75.91399094	Twelfth Street, North
6	1	1		30	0	40.35925051	-75.91448078	Union Street
7	1	1	1	15	4	40.35924946	-75.91456661	Union Street
8	1	1		27	0	40.359166N	75.914766W	Union Street
9	1	3		15	2	40.359286N	75.917776W	Tenth Street, North
10	1	3		12	2	40.359233N	75.917655W	Tenth Street, North
11	1	3		13	2	40.359199N	75.917753W	Tenth Street, North
12	1	3	3	9	1	40.360473N	75.915310W	Eleventh Street, North
13	1	3		13	1			Eleventh Street, North
14	2	2	4	0	0	40.35919507	-75.91577964	Eleventh Street, North
15	4	3	3	0	0	7204	-75.91649009	Eleventh Street, North
16	1	1	4	11	0	5422	-75.91217106	Union Street
17	1	1	4	0	0	5018	-75.9123537	Union Street



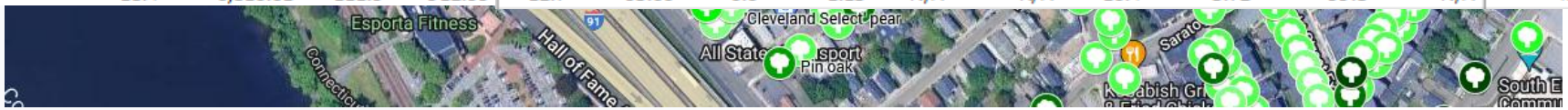
Mobile data collection with map coordinates

Detailed and flexible reporting

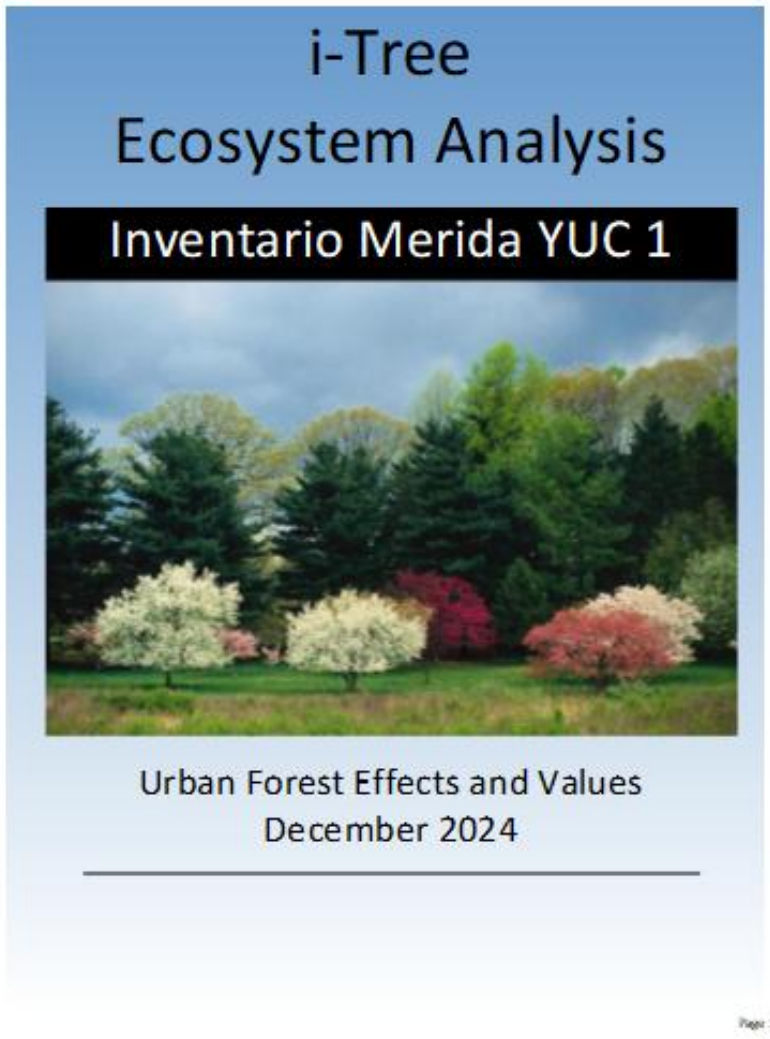
Benefits and Costs Summary of Individual Trees

Location: Merida, Merida, Yucatan, Mexico
Project: Inventario Merida YUC 1, Series: Inventario, Year: 2015
Generated: 12/11/2024

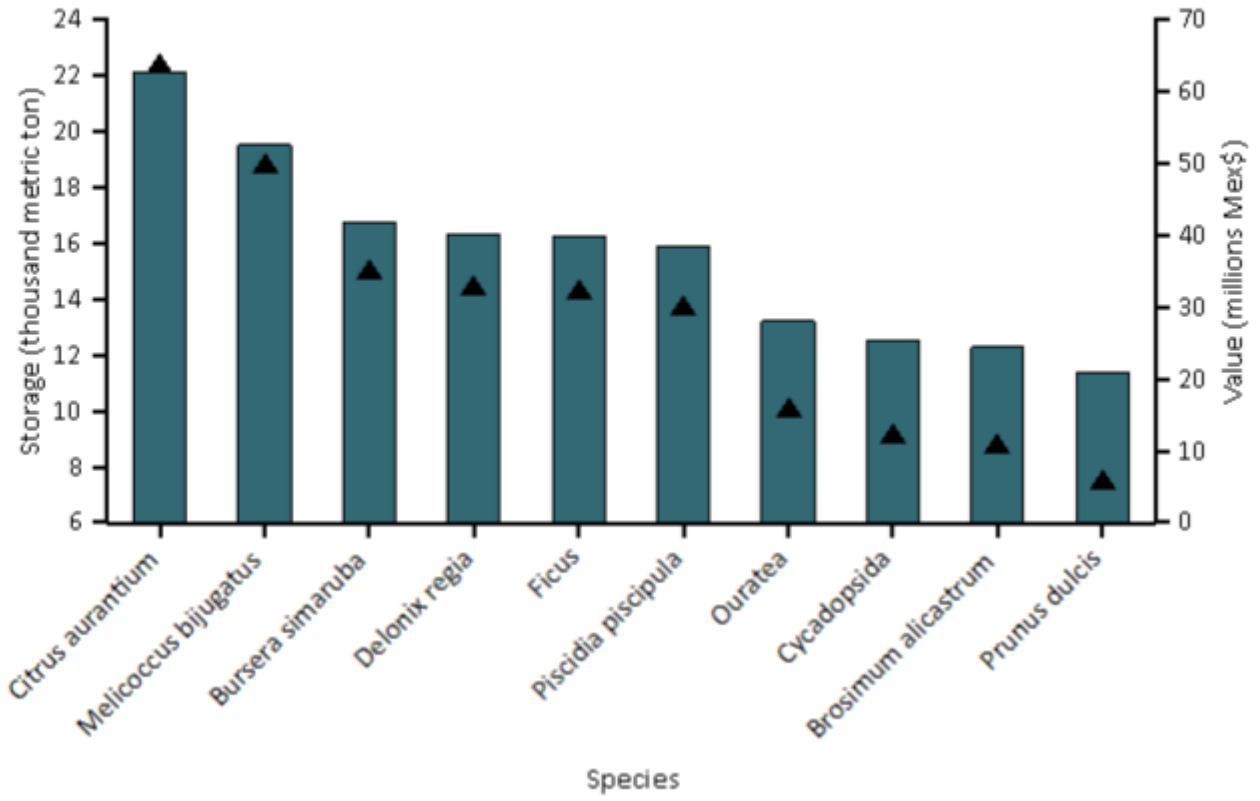
							Annual benefits											
Plot ID	Tree ID	Species Name	DBH (cm)	Replacement Value (MexS)	Carbon Storage (kg)	Carbon Storage (MexS)	Gross Carbon Sequestration (kg/yr)	Gross Carbon Sequestration (MexS/yr)	Avoided Runoff (m^3/yr)	Avoided Runoff (MexS/yr)	Carbon Avoided (kg/yr)	Carbon Avoided (MexS/yr)	Pollution Removal (g/yr)	Pollution Removal (MexS/yr)	Oxygen Production (kg/yr)	Energy Savings (MexS/yr)	Total Annual Benefits (MexS/yr)	xCoordinate	yCoordinate
33	1	Damburneya coriacea	19.7	11,989.73	92.9	260.48	19.5	54.82	0.1	5.69	N/A	N/A	51.6	28.24	52.1	N/A	88.75	-89.60035	20.936285
33	2	Diospyros	17.0	11,370.10	39.5	110.84	12.3	34.59	0.1	5.37	N/A	N/A	48.7	26.66	32.9	N/A	66.62	-89.600327	20.936275
33	3	Adonidia merrillii	5.5	201.22	2.6	7.16	0.5	1.48	0.0	0.18	N/A	N/A	1.6	0.89	1.4	N/A	2.55	-89.600378	20.936187
33	4	Diospyros	7.1	1,756.92	3.9	10.98	2.5	6.90	0.0	0.78	N/A	N/A	7.1	3.88	6.6	N/A	11.56	-89.600379	20.936247
35	1	Citrus aurantium	17.0	8,453.42	80.1	224.57	13.5	37.97	0.1	2.53	N/A	N/A	23.0	12.58	36.1	N/A	53.09	-89.608214	20.945798
35	2	Pouteria	22.0	15,504.04	72.6	203.67	13.6	38.15	0.4	19.84	N/A	N/A	179.9	98.54	36.3	N/A	156.53	-89.608253	20.945772
35	3	Citrus aurantium	18.0	10,574.38	93.1	261.10	17.5	49.06	0.1	3.81	N/A	N/A	34.6	18.93	46.6	N/A	71.79	-89.608335	20.945749
35	4	Citrus aurantium	15.5	7,022.30	85.1	238.84	6.0	16.91	0.1	4.28	N/A	N/A	38.8	21.26	16.1	N/A	42.45	-89.608299	20.945691
36	1	Chrysophyllum cainito	14.0	8,856.50	27.0	75.82	3.0	8.33	0.2	8.51	N/A	N/A	77.2	42.27	7.9	N/A	59.11	-89.597901	20.949162
36	2	Citrus aurantium	7.5	2,046.41	11.4	32.01	4.9	13.82	0.0	0.61	N/A	N/A	5.5	3.01	13.1	N/A	17.44	-89.597993	20.948989
38	2	Bursera simaruba	21.2	8,877.68	68.6	192.53	8.9	24.86	0.2	8.89	N/A	N/A	80.7	44.18	23.6	N/A	77.93	-89.603862	20.925089
38	3	Delonix regia	24.1	7,676.97	95.8	268.72	6.9	19.29	0.0	1.14	N/A	N/A	10.4	5.67	18.3	N/A	26.10	-89.603879	20.92603
38	4	Syagrus romanzoffiana	34.0	2,805.71	28.8	80.72	0.6	1.78	0.0	0.96	N/A	N/A	8.7	4.75	1.7	N/A	7.49	-89.603845	20.099507
38	5	Delonix regia	36.0	6,333.57	254.0	712.59	5.4	15.23	0.1	2.80	N/A	N/A	25.4	13.93	14.5	N/A	31.96	-89.603866	20.925189
38	6	Beaucarnea	8.9	1,275.68	11.5	32.38	1.3	3.61	0.0	0.54	N/A	N/A	4.9	2.67	3.4	N/A	6.81	-89.603845	20.909507
38	63	Ficus	33.0	32,933.53	249.0	698.31	26.1	73.16	1.0	46.80	N/A	N/A	424.4	232.47	69.6	N/A	352.44	-89.603851	20.924954
40	24	Citrus aurantium	15.0	10,733.46	59.1	165.84	16.7	46.72	0.1	3.10	N/A	N/A	28.1	15.38	44.4	N/A	65.20	-89.571157	20.955795
40	25	Ouratea	18.4	6,810.61	111.3	312.33	12.7	35.60	0.0	1.15	N/A	N/A	10.4	5.72	33.8	N/A	42.48	-89.571281	20.955558



Detailed and flexible reporting



Trees in Inventario Merida YUC 1 are estimated to store 249000 metric tons of carbon (Mex$699 million). Of the species sampled, Citrus aurantium stores and sequesters the most carbon (approximately 8.96% of the total carbon stored and 14.1% of all sequestered carbon.)



Detailed and flexible reporting: More options and results

Additional ecosystem services

- UV impacts
- Allergy/Pollen
- Food
- Leaf nutrients
- Wood products

Replacement value

Management information

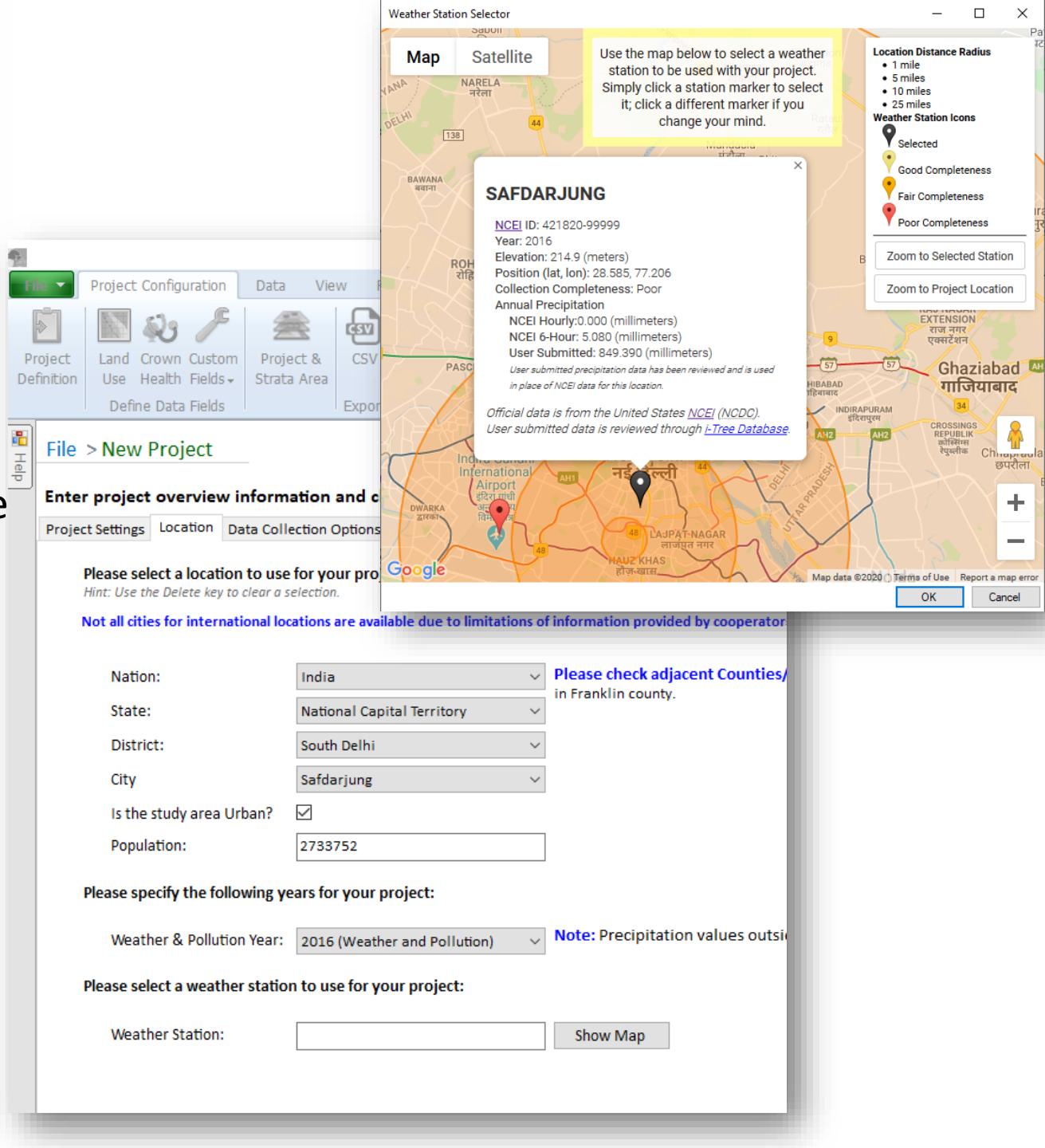
- Tree health
- Relative performance index
- Infrastructure conflicts
- (3) customizable fields

Cost benefit analysis

Species	Crown Health							RPI	# of Trees
	Excellent (%)	Good (%)	Fair (%)	Poor (%)	Critical (%)	Dying (%)	Dead (%)		
Acacia	1.1	7.1	12.4	26.9	16.9	26.2	9.4	0.70	89,650
Acrocomia	0.0	50.0	50.0	0.0	0.0	0.0	0.0	1.42	1,691
Acrocomia aculeata	40.0	60.0	0.0	0.0	0.0	0.0	0.0	1.55	4,227
Adonidia merrillii	39.1	30.3	11.3	16.3	0.0	0.0	3.1	1.39	30,614
Albizia	0.0	13.1	86.9	0.0	0.0	0.0	0.0	1.31	6,461
Albizia saman	22.8	0.0	43.7	26.9	6.6	0.0	0.0	1.28	14,216
Annona	2.2	8.1	20.1	29.7	25.3	14.6	0.0	0.91	45,406
Annona muricata	0.0	26.4	0.0	48.7	24.8	0.0	0.0	1.01	7,541
Annona reticulata	0.0	7.5	37.0	24.5	12.6	18.5	0.0	0.95	15,387
Annona squamosa	0.0	0.0	82.6	17.4	0.0	0.0	0.0	1.24	6,588
Araucaria	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.22	947
Azadirachta	0.0	33.3	66.7	0.0	0.0	0.0	0.0	1.38	2,536
Azadirachta indica	18.6	15.2	18.6	28.9	18.6	0.0	0.0	1.19	6,163
Bauhinia variegata	0.0	54.2	0.0	45.8	0.0	0.0	0.0	1.24	1,847
Beaucarnea	61.1	11.6	11.4	4.1	3.5	8.3	0.0	1.39	24,380
Beaucarnea recurvata	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1.46	1,148
Bougainvillea	21.1	0.0	22.6	0.0	37.6	0.0	18.8	0.83	4,498
Brosimum alicastrum	10.2	27.1	20.2	32.8	0.0	3.0	6.7	1.19	31,115
Brugmansia	26.3	26.3	47.5	0.0	0.0	0.0	0.0	1.43	3,563
Bursera simaruba	5.8	6.9	9.7	10.2	17.6	47.4	2.4	0.60	152,928
Byrsonima	0.0	30.2	30.7	7.5	14.9	7.5	9.1	1.04	12,552
Caesalpinia	2.3	7.4	9.9	38.3	18.4	17.9	5.7	0.80	49,558
Caesalpinia pulcherrima	50.0	0.0	50.0	0.0	0.0	0.0	0.0	1.40	1,894
Carica papaya	15.0	32.5	44.7	0.0	3.9	3.9	0.0	1.33	24,486

i-Tree Eco: Advantages

- **Local modeling** – uses local weather, pollution and location characteristics for modeling
- **Dynamic model** – constantly improved
- **Flexible data** collection and project design options
- **Data import** is an easy way to assess existing tree inventory data
- **Options to improve** the model. e.g. users can submit new species, hourly rainfall data, biomass equations



i-Tree Eco: Limitations

- **Local data limitations** – May not be available or representative of conditions
- **Science limitations** – Limited to species models and data we have
- **Software challenges** – Eco can be challenging to learn
- **Accuracy depends on data** – Most accurate results require more measurements

Keys to success with i-Tree Eco

- Understand tool advantages, limitations, and options available
- Define your objectives
- Evaluate your resources (*time, equipment, money, technical capacity, potential collaborators*)
- Consider pilot projects
  - used to learn
  - show potential
  - justify scaling up projects

Connect to things that matter to people

Learn More…

… About how the models work
- Understanding i-Tree

… About Field Data collection
- Cheat sheets (German, French)
- Field guide

… About using the software
- User's Manual
- Videos (YouTube Channel)
- Documentation by language

… About using results
- Foreign language reports
- US reports
- Beyond the written report