What's new with i-Tree

Tools for assessing and managing community forests

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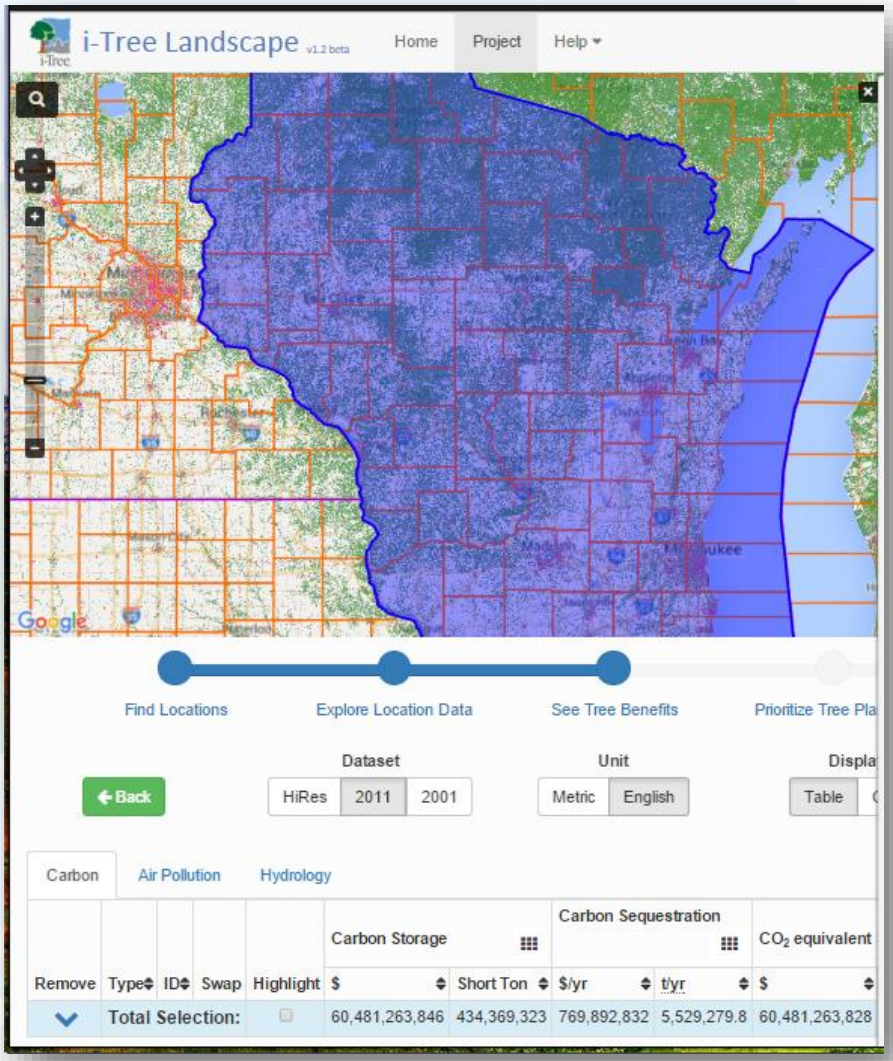
Plan for today…

- An “All lands” approach
- i-Tree Landscape
- i-Tree Eco v6 & Streets update



The 2016 i-Tree Suite of Tools

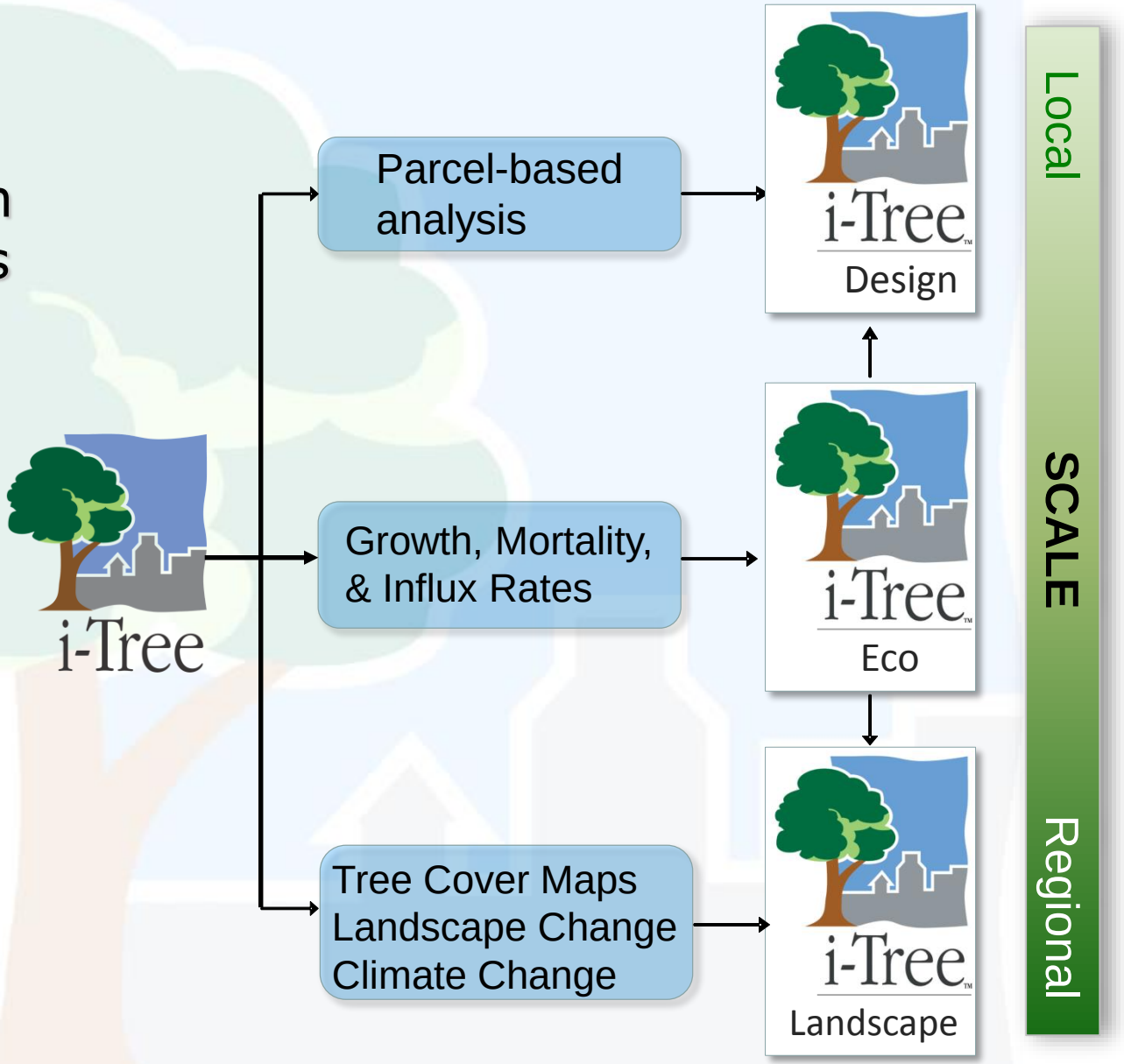
Web-based, run in your browser

Installed on a Windows desktop or laptop

DAVEY Arbor Day Foundation sma ISA Casey Trees ESF NAASF

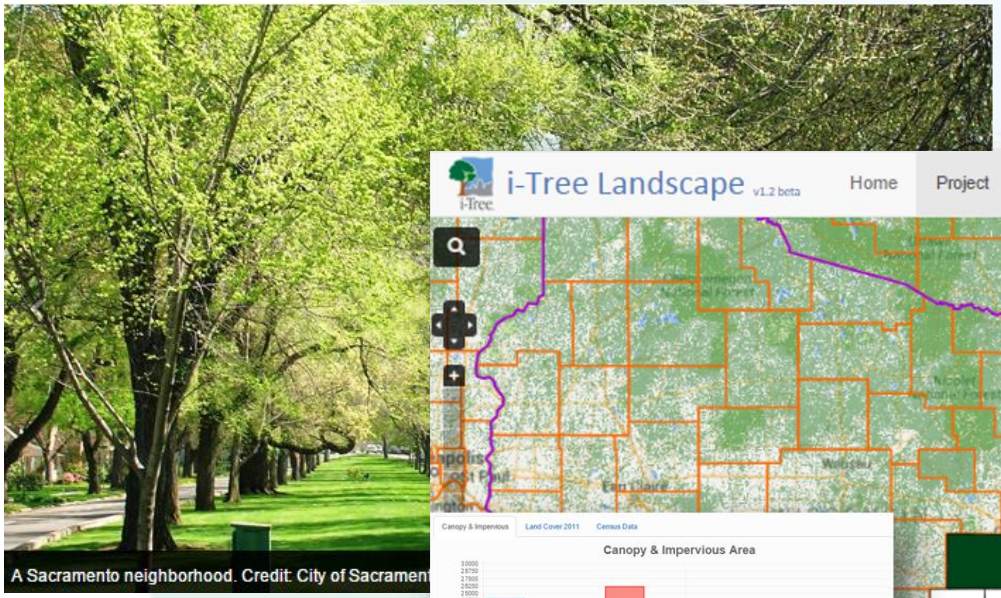
"All Lands" approach to natural resource stewardship

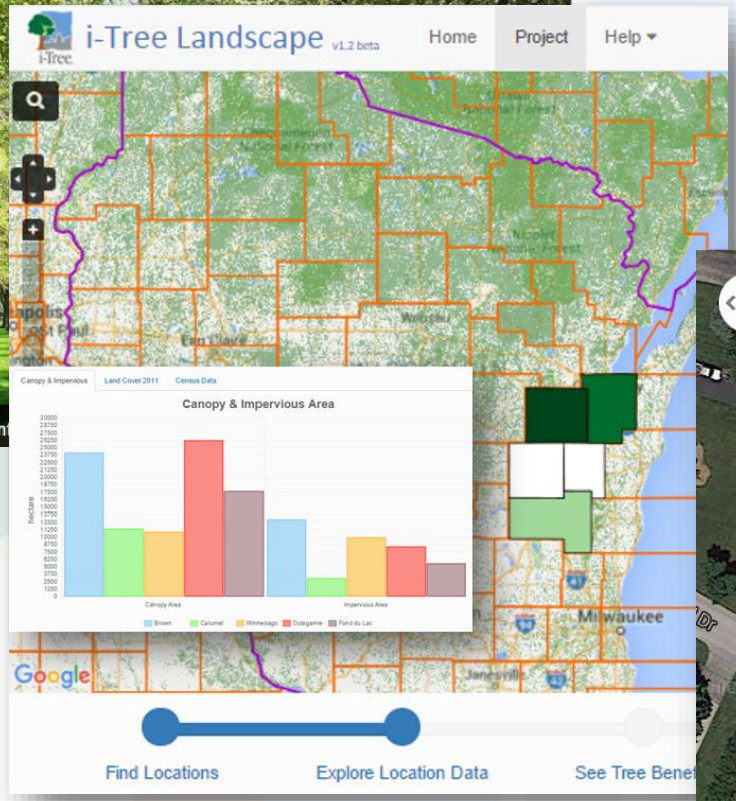
- Restore & sustain forest landscapes
- Make landscapes more resilient to climate change
- Enhance water resources
- Create jobs & sustainable communities

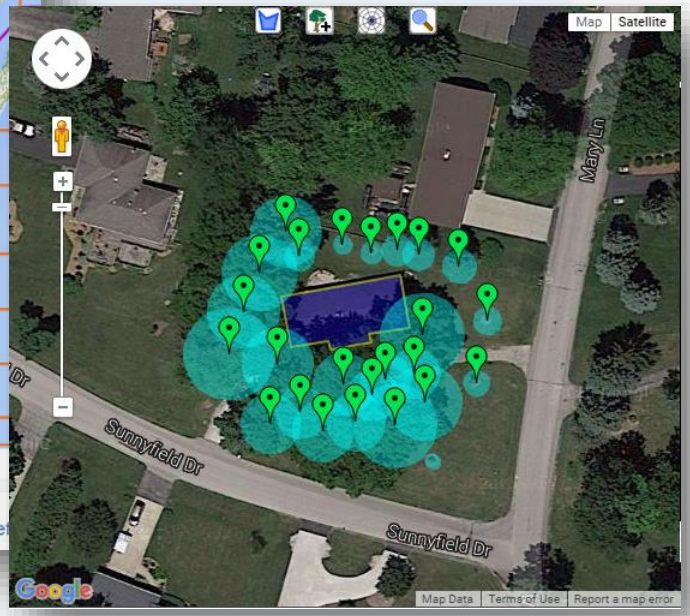


DAVEY Arbor Day Foundation sma ISA Casey Trees ESF NAASF

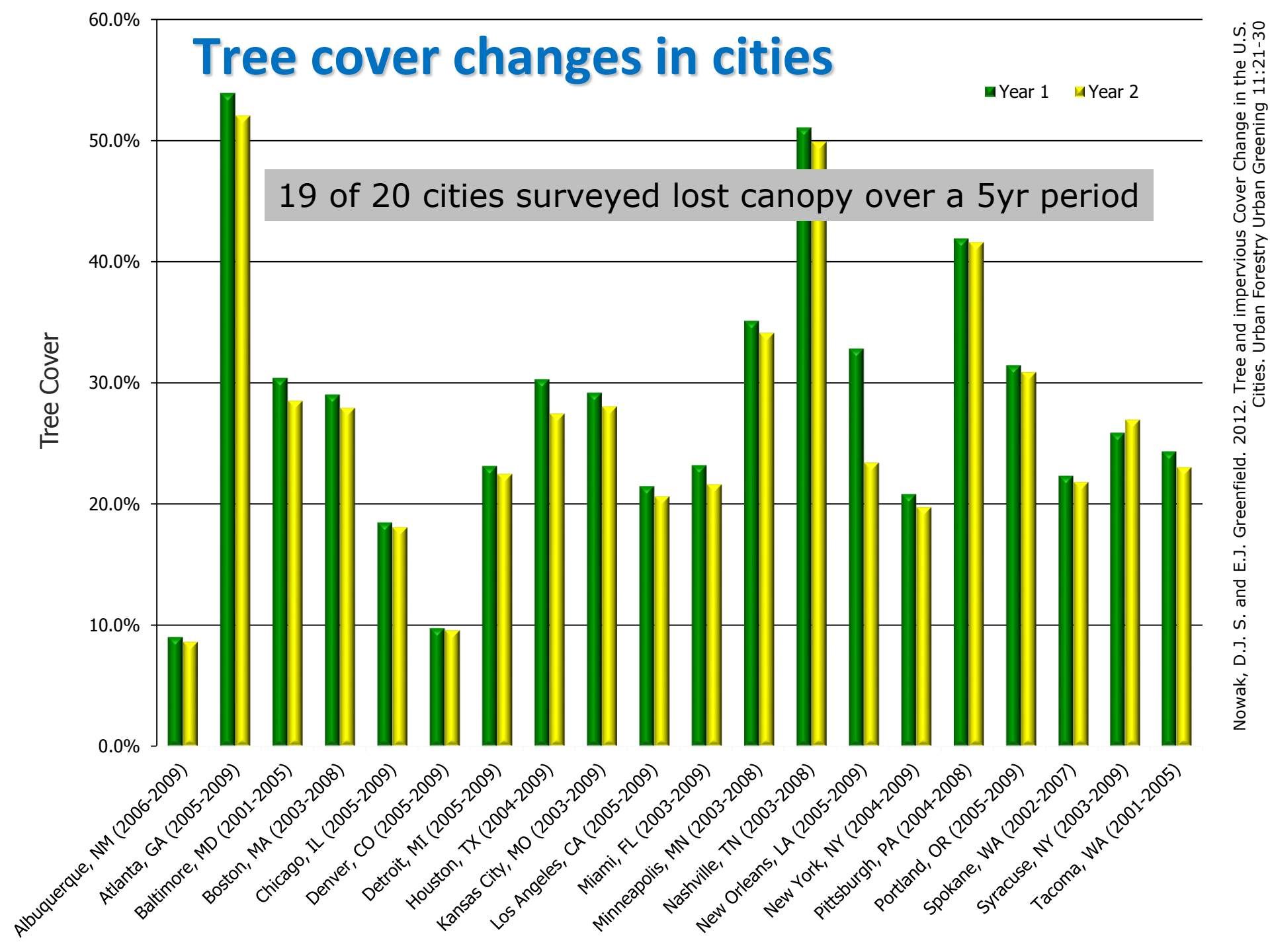
Structure ➡ Function ➡ Value







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

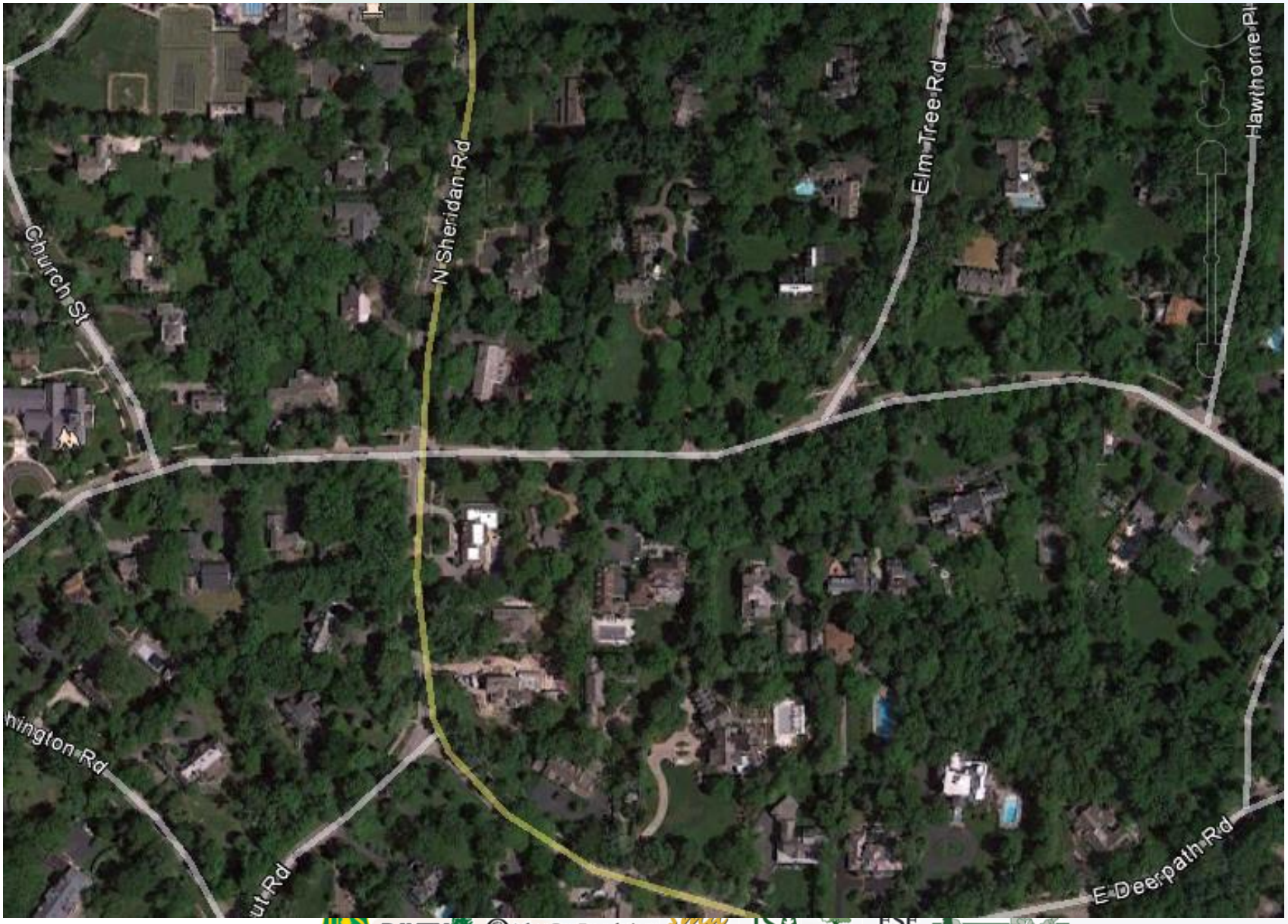


Nowak, D.J. S. and E.J. Greenfield. 2012. Tree and impervious Cover Change in the U.S. Cities. Urban Forestry Urban Greening 11:21-30

Why private property trees matter

St. Elizabeth Hospital D.C. 2006-2011 - courtesy of Casey Trees

Why private property trees matter



Connecting trees and people…

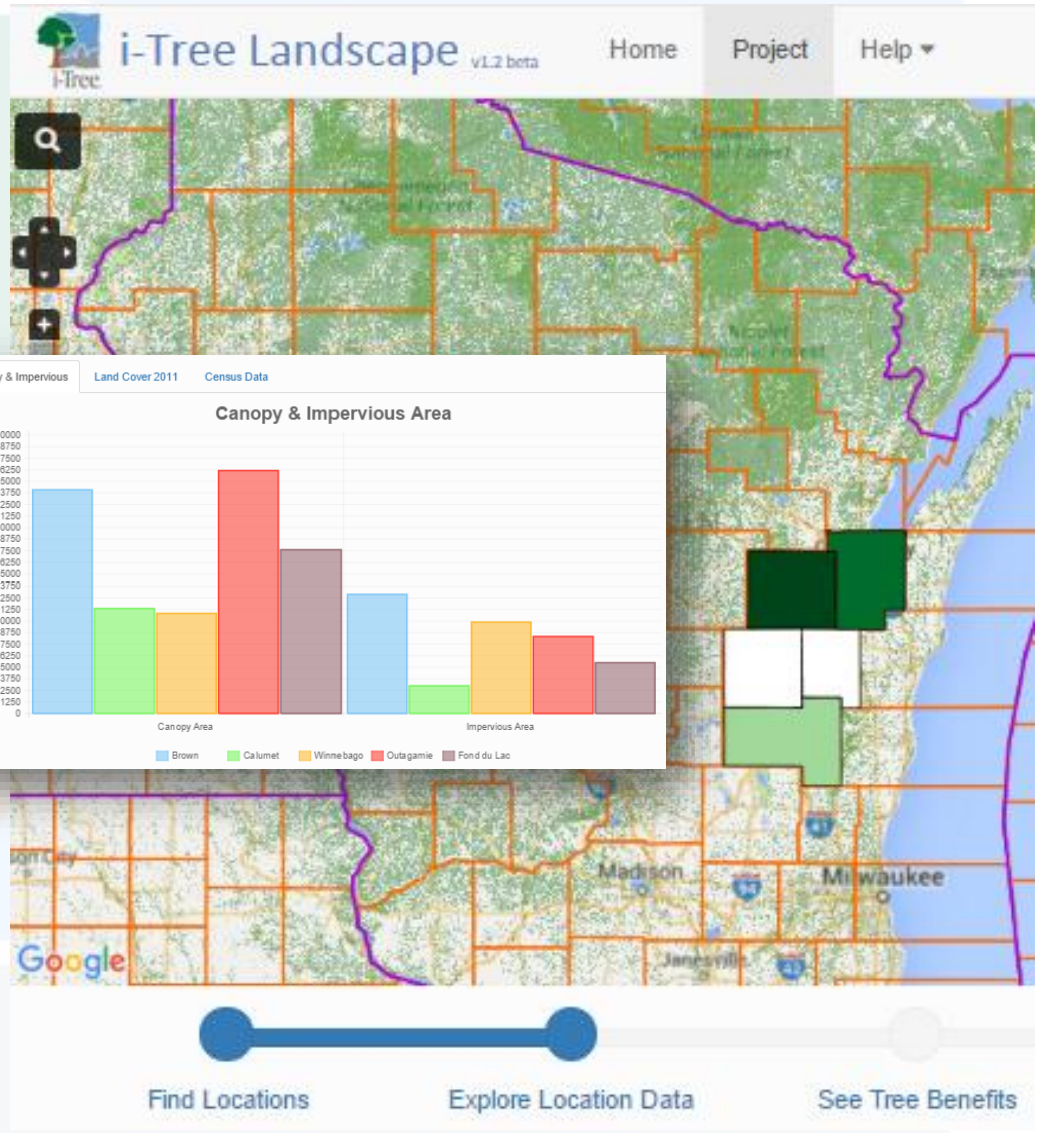
Improving public health through air pollution removal

U.S. urban forests remove 717,000 tons of air pollutants per year worth $4.7 billion/year

- Public health impacts: incidence reduction of:
  - ~580 deaths / year
  - ~580 emergency room visits / year
  - ~330,000 asthma exacerbations / year
  - ~485,000 acute respiratory symptoms / year

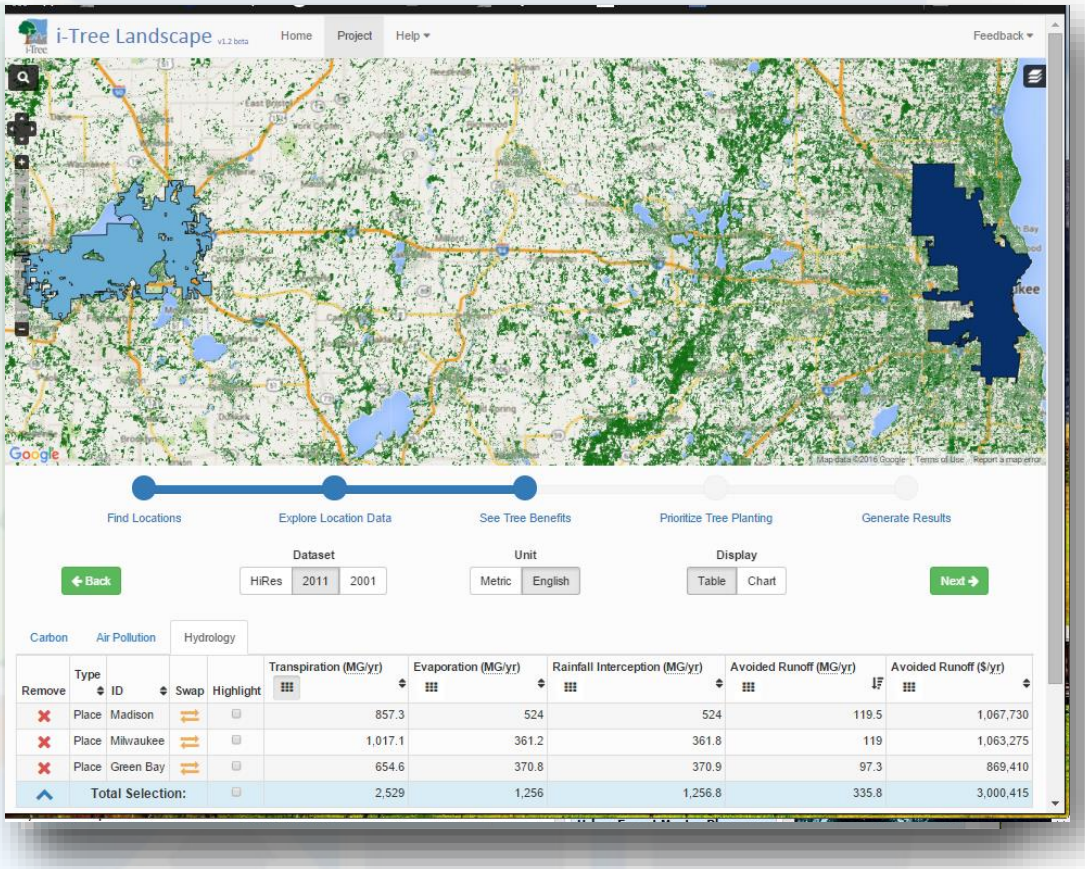
i-Tree Landscape vision

- A spatially distributed model that estimates ecosystem services of trees <u>on all lands</u>



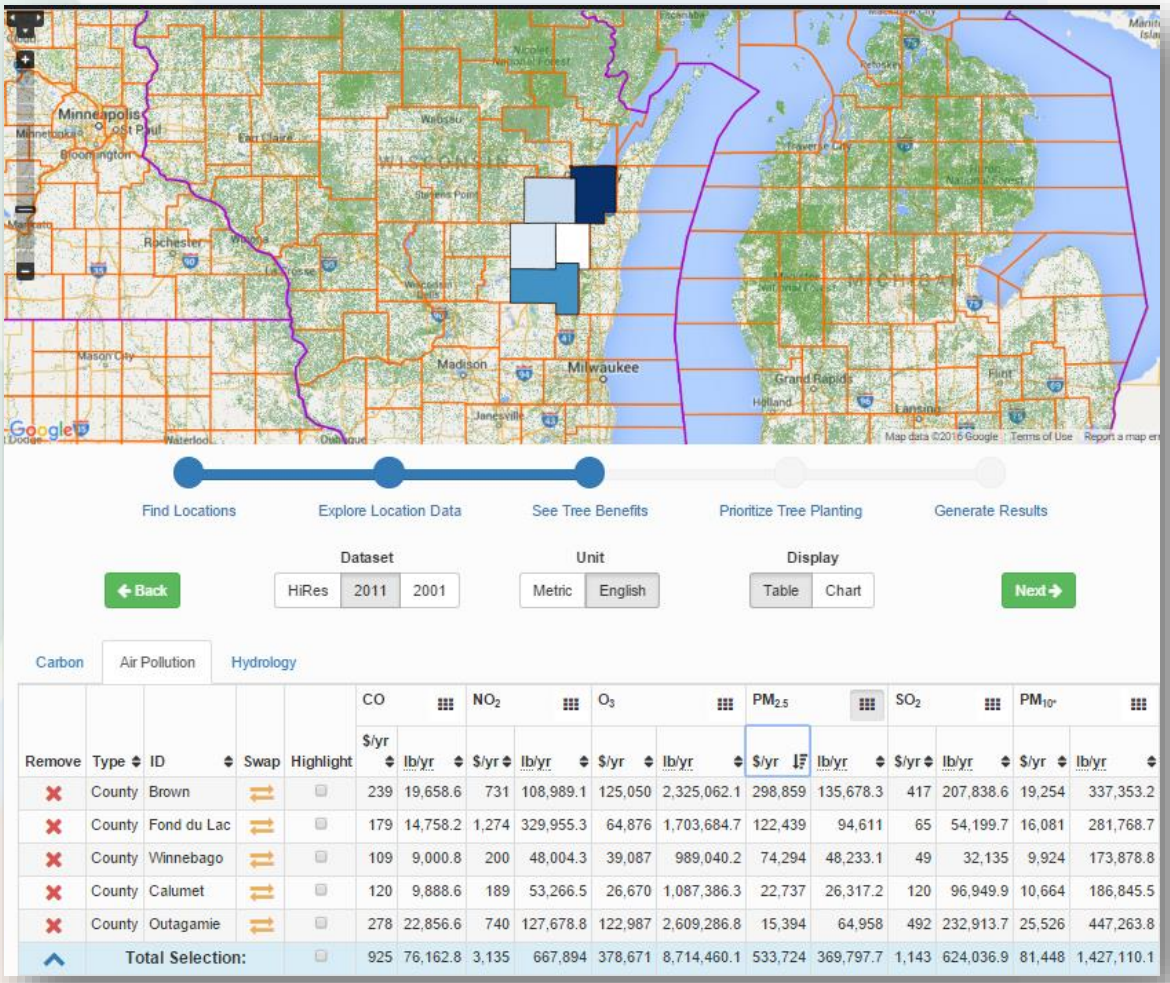
i-Tree Landscape basics

- Web browser tool using:
  - Tree cover, impervious cover, land cover (NLCD 2011 & UTC where available)
  - Census block groups and places
  - County, state, congressional district boundaries
  - National Forests & Parks



i-Tree Landscape basics

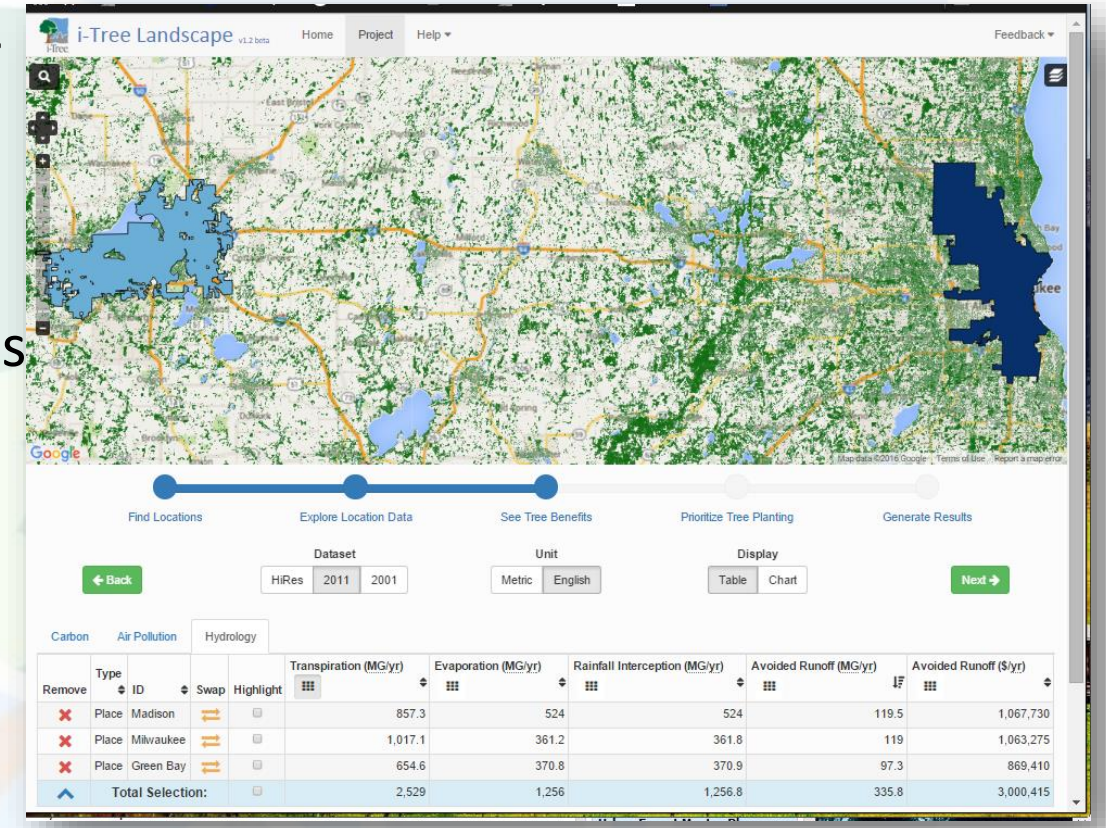
- Tree benefits derived from
  - Tree cover estimates
  - Land classification
  - UF & FIA data
  - Local environmental variables
  - Human populations – census data
  - i-Tree Eco urban and rural pollution modeling and hydrology modeling



Remove	Type	ID	Swap	Highlight	CO $/yr	CO lb/yr	NO_2 $/yr	NO_2 lb/yr	O_3 $/yr	O_3 lb/yr	$PM_{2.5}$ $/yr	$PM_{2.5}$ lb/yr	SO_2 $/yr	SO_2 lb/yr	PM_{10*} $/yr	PM_{10*} lb/yr
✖	County	Brown	⇄	☐	239	19,658.6	731	108,989.1	125,050	2,325,062.1	298,859	135,678.3	417	207,838.6	19,254	337,353.2
✖	County	Fond du Lac	⇄	☐	179	14,758.2	1,274	329,955.3	64,876	1,703,684.7	122,439	94,611	65	54,199.7	16,081	281,768.7
✖	County	Winnebago	⇄	☐	109	9,000.8	200	48,004.3	39,087	989,040.2	74,294	48,233.1	49	32,135	9,924	173,878.8
✖	County	Calumet	⇄	☐	120	9,888.6	189	53,266.5	26,670	1,087,386.3	22,737	26,317.2	120	96,949.9	10,664	186,845.5
✖	County	Outagamie	⇄	☐	278	22,856.6	740	127,678.8	122,987	2,609,286.8	15,394	64,958	492	232,913.7	25,526	447,263.8
^	Total Selection:			☐	925	76,162.8	3,135	667,894	378,671	8,714,460.1	533,724	369,797.7	1,143	624,036.9	81,448	1,427,110.1

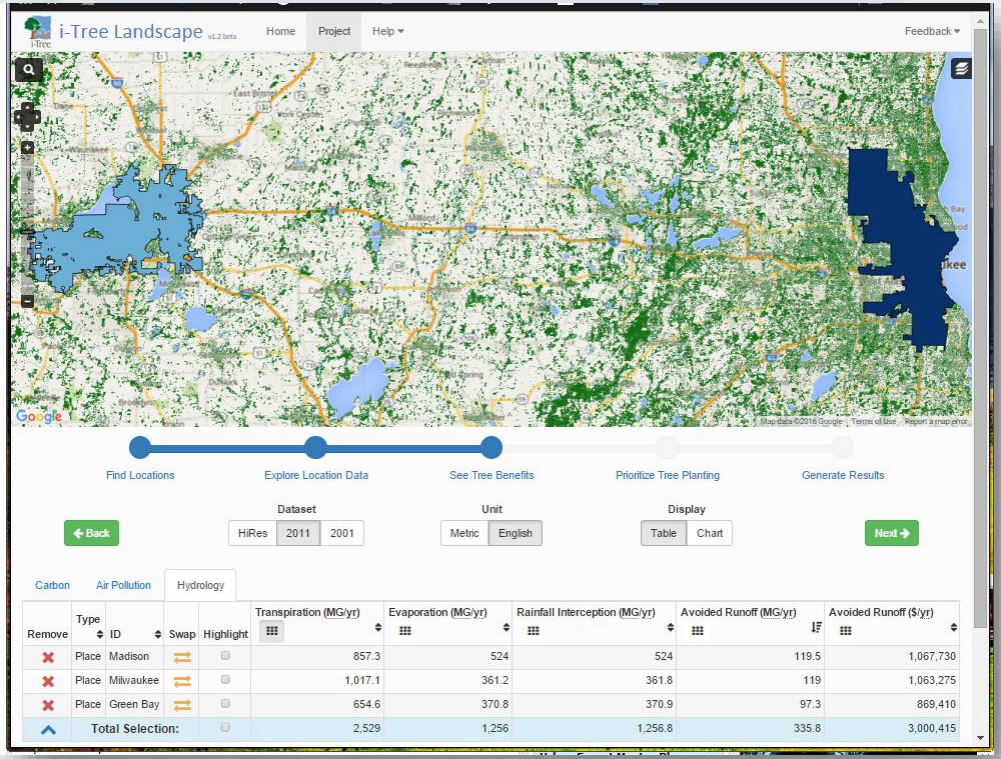
What does i-Tree Landscape provide?

- Canopy & impervious cover estimates
- Ecosystem service estimates
  - Carbon storage & sequestration
  - Air pollution reduction
  - Hydrology effects
- Assist with tree prioritization based on user criteria



Why i-Tree Landscape Matters?

- Online accessible
- Engage audiences visually
- Explore relationships of trees, people and land
- An “All lands” approach to estimating tree benefits



Home Page

Home - i-Tree Landscape

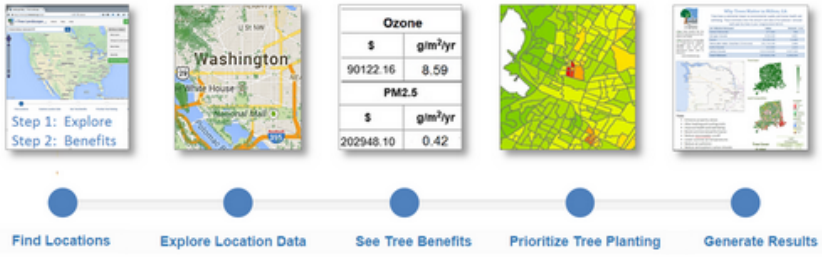
https://landscape.itreetools.org

i-Tree Landscape v1.1 beta

Home | Project | Help | Feedback

Welcome to i-Tree Landscape! v1.1 beta

Offering more than just beauty and shade, trees provide intangible benefits, such as removal of atmospheric carbon dioxide and pollution, stormwater reduction, temperature modification, and more. i-Tree Landscape allows you to explore tree canopy, land cover, and basic demographic information in a location of your choosing. With the information provided by i-Tree Landscape, you will learn about the benefits of trees in your selected location, see how planting trees will increase the benefits provided, and map the areas where you decide to prioritize your tree planting efforts.



i-Tree Landscape

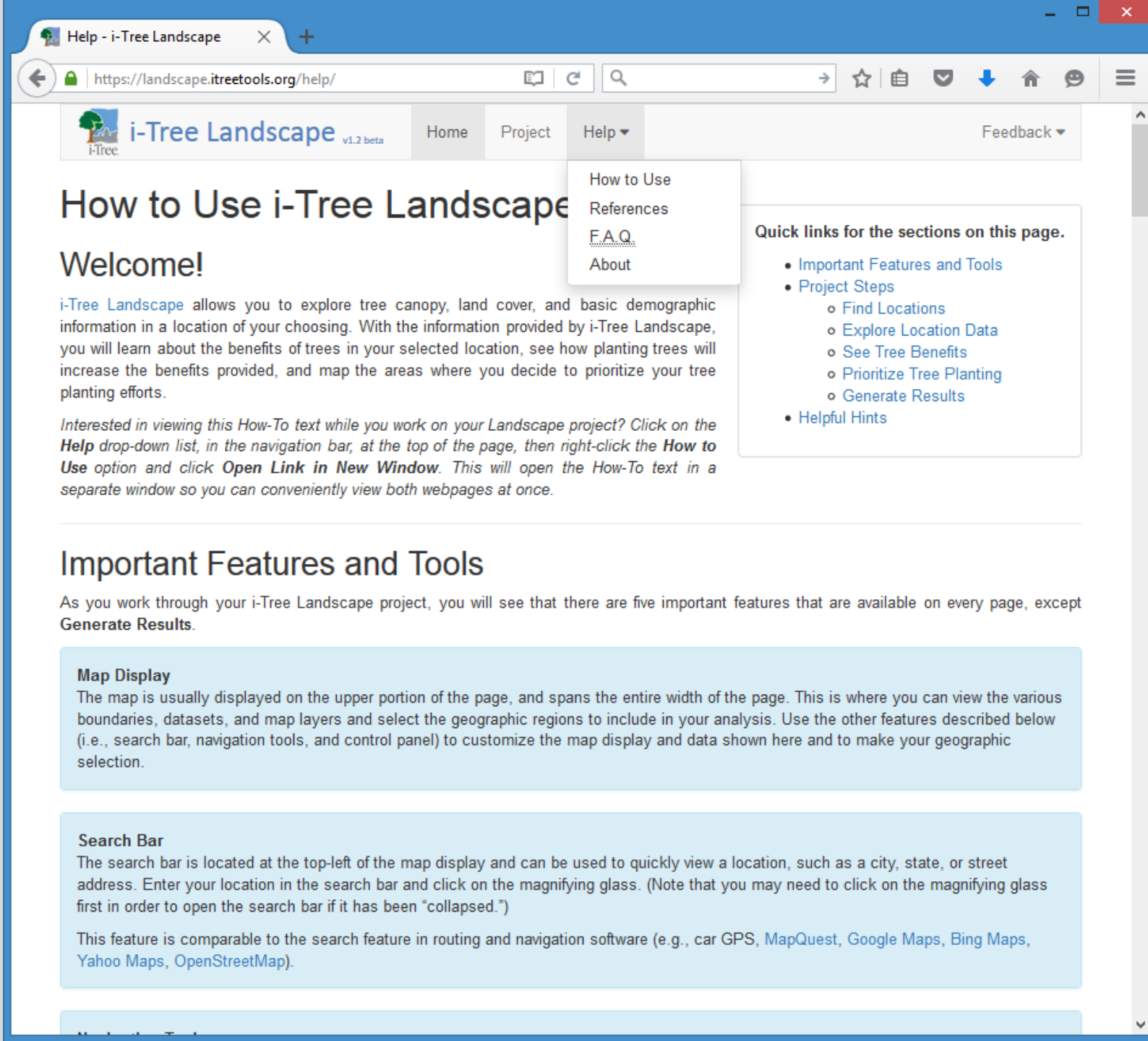
Get Started

By removing carbon dioxide, trees help mitigate climate change. The shade provided by urban tree canopies can also help minimize the urban heat island effect. In addition, trees intercept stormwater, which can reduce flooding and improve water quality, and reduce air pollution, such as ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and fine particulate matter. Reduction of air pollution has proven benefits to human health - trees truly can enhance our lives! Click Get Started to begin an i-Tree Landscape project now.

i-Tree and its partners do not endorse any specific web-browser, but i-Tree Landscape has been tested to work well with modern versions of Chrome, Firefox, Internet Explorer, and Safari. Please, use the Feedback form to report issues.

USFS | DAVEY | Arbor Day Foundation | sma | ISA | Casey Trees | ESF | NAASF

Help and References



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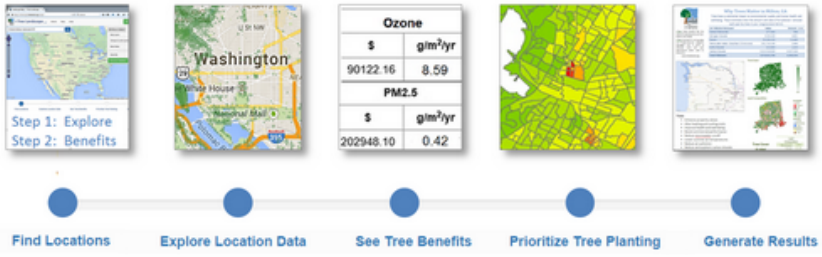

i-Tree Landscape

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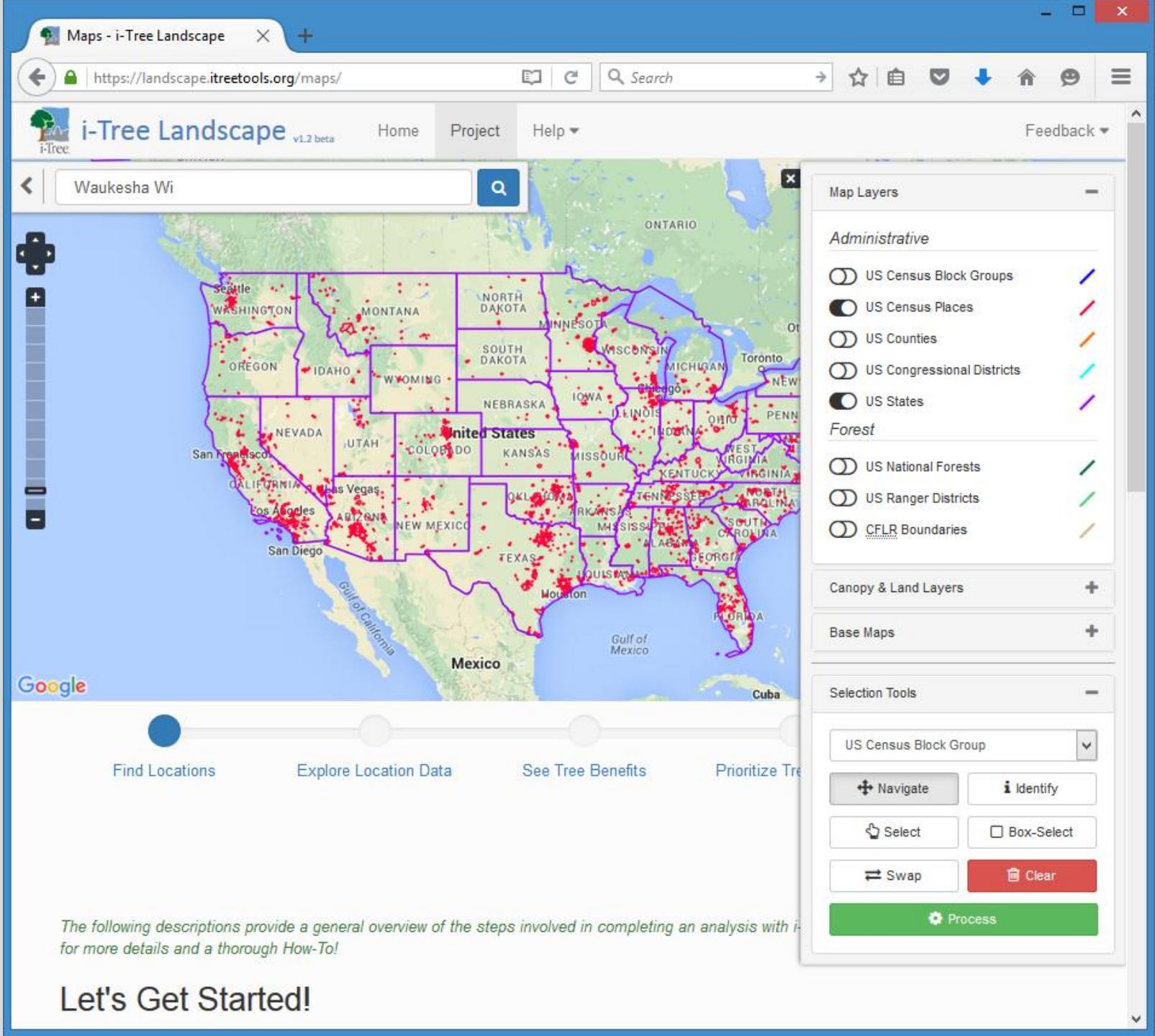
Maps
Layers


Maps - i-Tree Landscape
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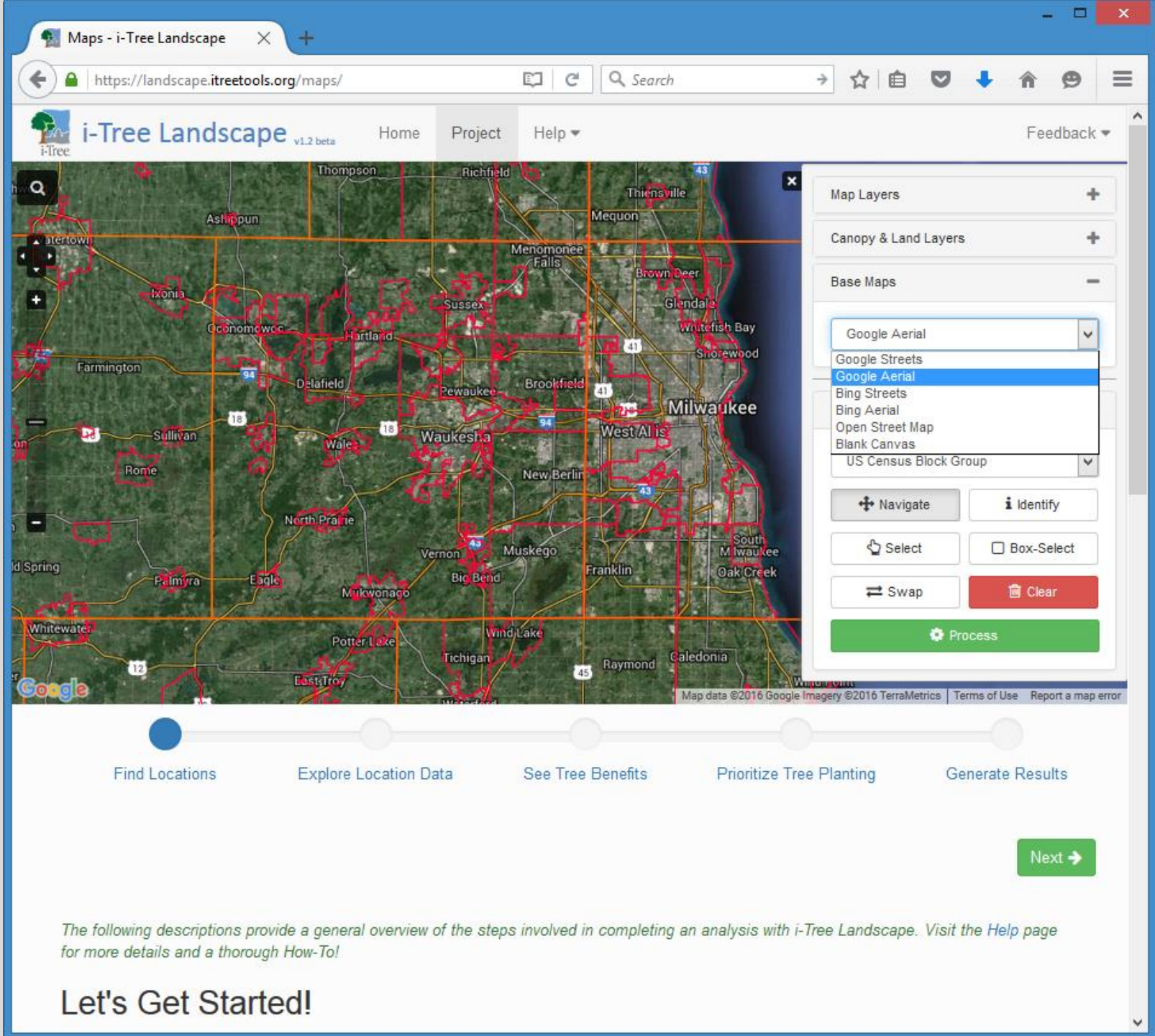
Map Layers
Administrative
US Census Block Groups
US Census Places
US Counties
US Congressional Districts
US States
Forest
US National Forests
US Ranger Districts
CFLR Boundaries
Canopy & Land Layers
Base Maps
Selection Tools
US Census Block Group
Navigate
Identify
Select
Box-Select
Swap
Clear
Process
United States
Mexico
Gulf of Mexico
Gulf of California
Cuba
Ontario
Toronto
Seattle
San Francisco
Los Angeles
San Diego
Las Vegas
Houston
Chicago
Find Locations
Explore Location Data
See Tree Benefits
The following descriptions provide a general overview of the steps involved in completing an analysis with i-
for more details and a thorough How-To!
Let's Get Started!

Location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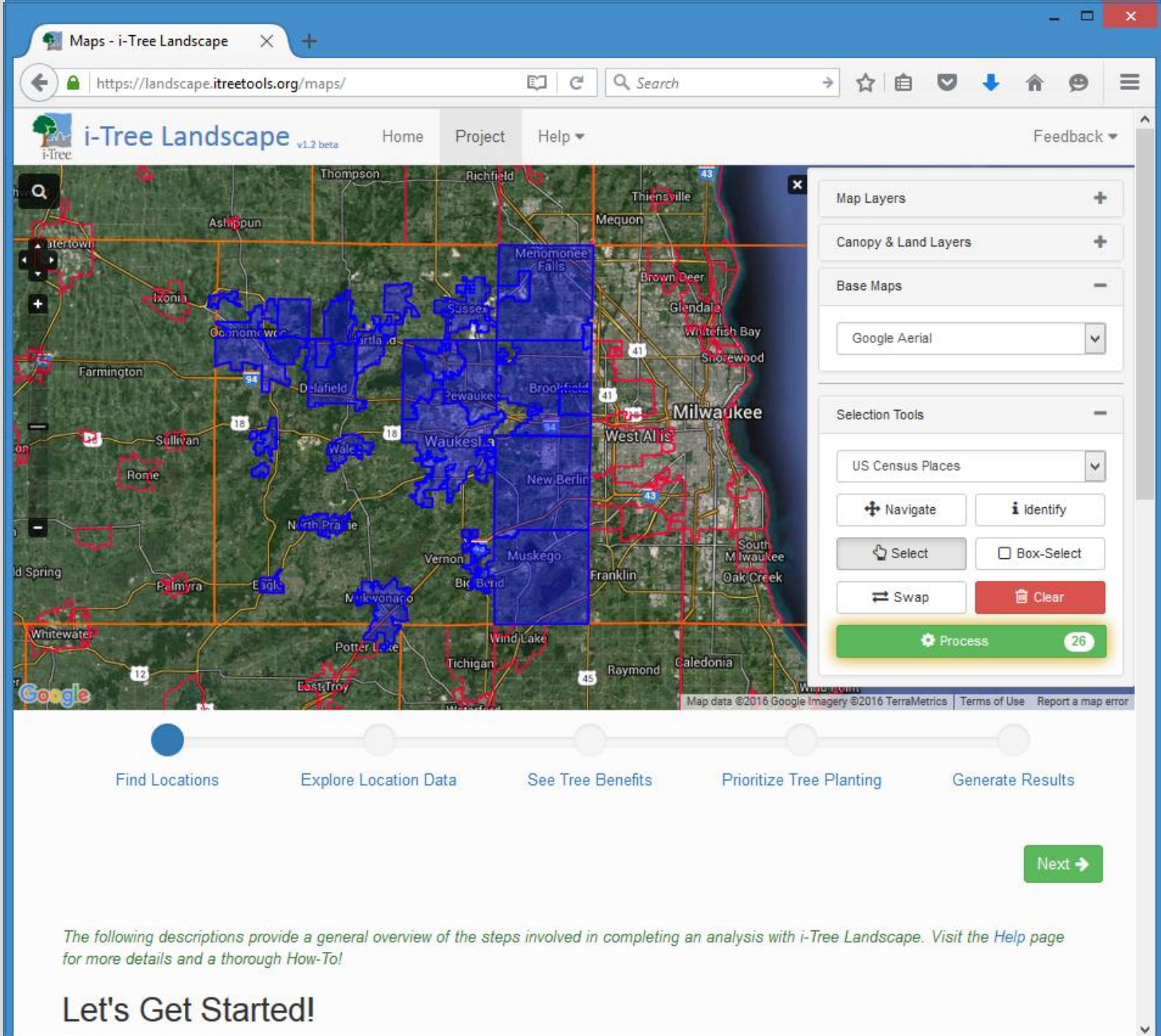
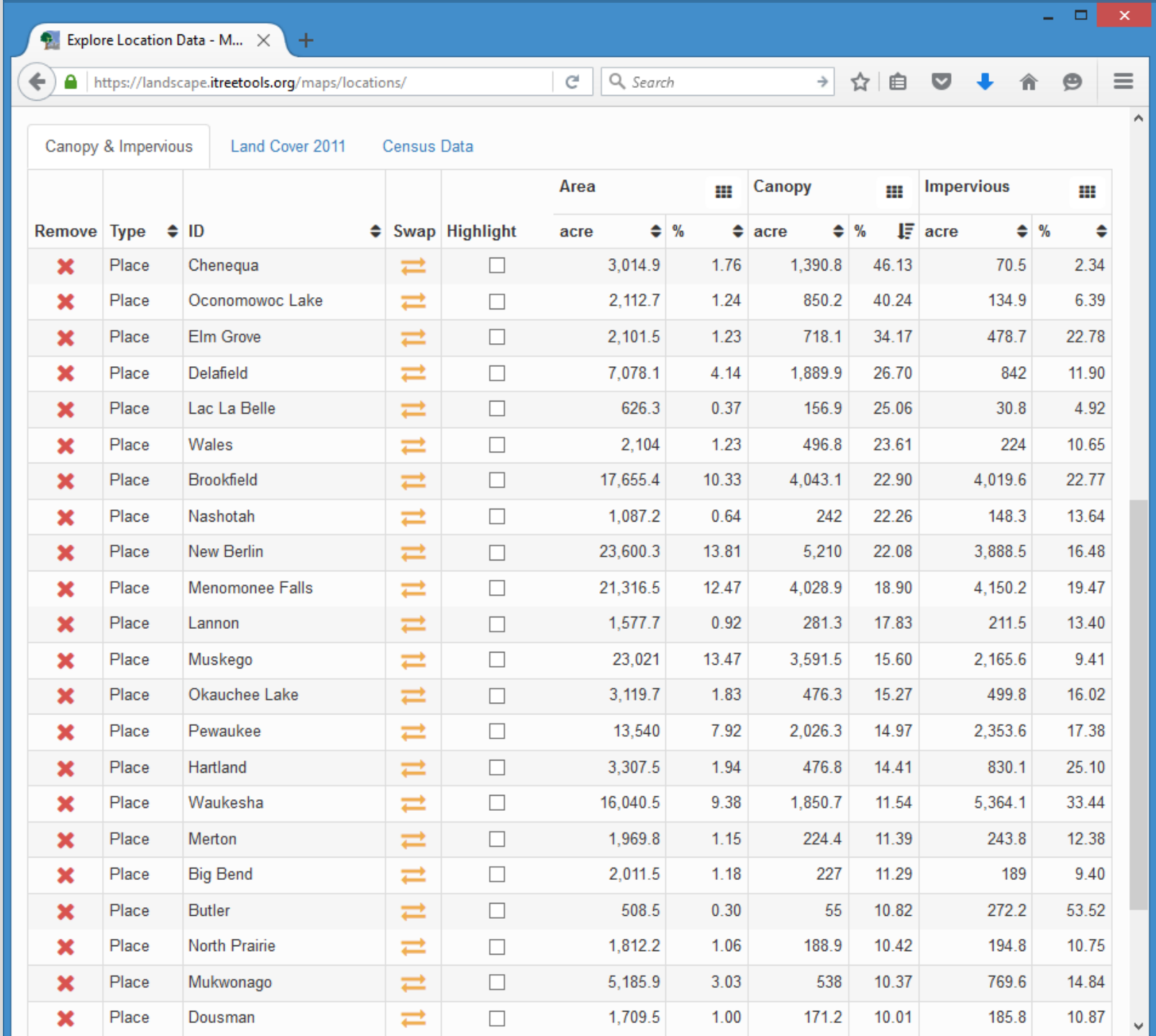
Map Layers
Canopy & Land Layers
Base Maps
Google Aerial
Google Streets
Google Aerial
Bing Streets
Bing Aerial
Open Street Map
Blank Canvas
US Census Block Group
Navigate
Identify
Select
Box-Select
Swap
Clear
Process
Milwaukee
Waukesha
Map data ©2016 Google Imagery ©2016 TerraMetrics
Terms of Use
Report a map error
Find Locations
Explore Location Data
See Tree Benefits
Prioritize Tree Planting
Generate Results
Next
The following descriptions provide a general overview of the steps involved in completing an analysis with i-Tree Landscape. Visit the Help page for more details and a thorough How-To!
Let's Get Started!

Step 1: Find a Location



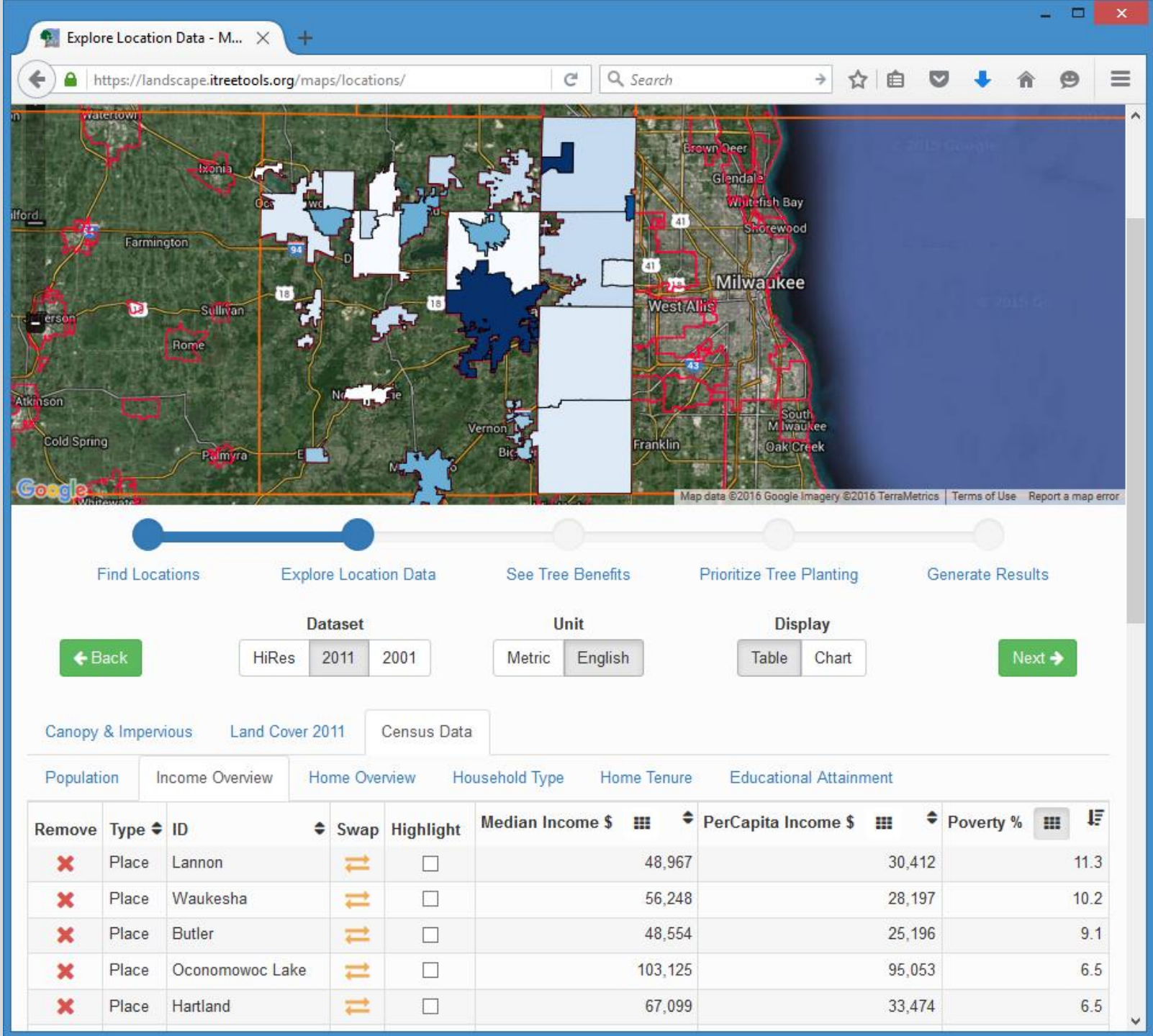
Step 2: Explore Location Data



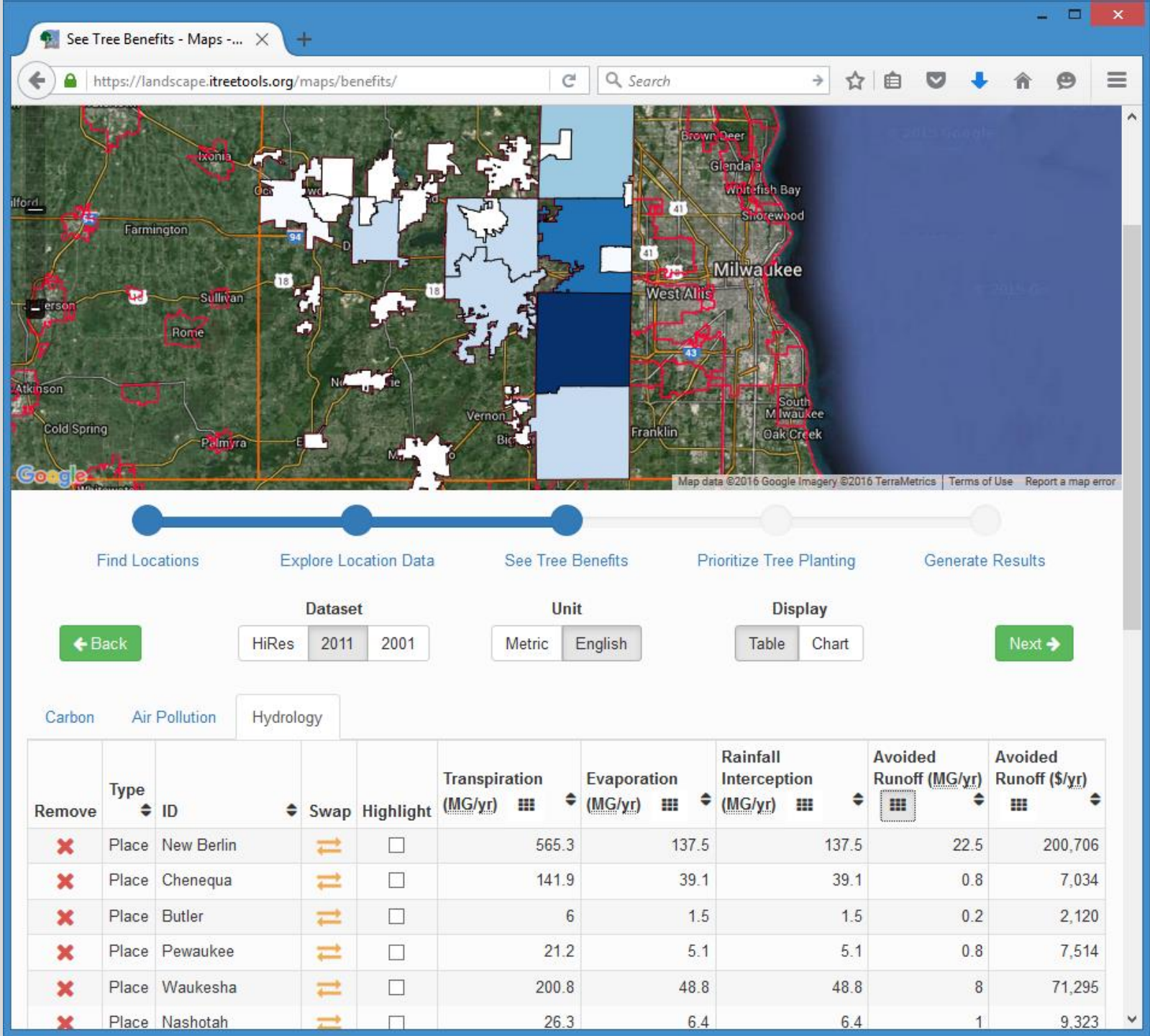
Canopy & Impervious | Land Cover 2011 | Census Data

Remove	Type	ID	Swap	Highlight	Area		Canopy		Impervious	
					acre	%	acre	%	acre	%
✖	Place	Chenequa	⇄	☐	3,014.9	1.76	1,390.8	46.13	70.5	2.34
✖	Place	Oconomowoc Lake	⇄	☐	2,112.7	1.24	850.2	40.24	134.9	6.39
✖	Place	Elm Grove	⇄	☐	2,101.5	1.23	718.1	34.17	478.7	22.78
✖	Place	Delafield	⇄	☐	7,078.1	4.14	1,889.9	26.70	842	11.90
✖	Place	Lac La Belle	⇄	☐	626.3	0.37	156.9	25.06	30.8	4.92
✖	Place	Wales	⇄	☐	2,104	1.23	496.8	23.61	224	10.65
✖	Place	Brookfield	⇄	☐	17,655.4	10.33	4,043.1	22.90	4,019.6	22.77
✖	Place	Nashotah	⇄	☐	1,087.2	0.64	242	22.26	148.3	13.64
✖	Place	New Berlin	⇄	☐	23,600.3	13.81	5,210	22.08	3,888.5	16.48
✖	Place	Menomonee Falls	⇄	☐	21,316.5	12.47	4,028.9	18.90	4,150.2	19.47
✖	Place	Lannon	⇄	☐	1,577.7	0.92	281.3	17.83	211.5	13.40
✖	Place	Muskego	⇄	☐	23,021	13.47	3,591.5	15.60	2,165.6	9.41
✖	Place	Okauchee Lake	⇄	☐	3,119.7	1.83	476.3	15.27	499.8	16.02
✖	Place	Pewaukee	⇄	☐	13,540	7.92	2,026.3	14.97	2,353.6	17.38
✖	Place	Hartland	⇄	☐	3,307.5	1.94	476.8	14.41	830.1	25.10
✖	Place	Waukesha	⇄	☐	16,040.5	9.38	1,850.7	11.54	5,364.1	33.44
✖	Place	Merton	⇄	☐	1,969.8	1.15	224.4	11.39	243.8	12.38
✖	Place	Big Bend	⇄	☐	2,011.5	1.18	227	11.29	189	9.40
✖	Place	Butler	⇄	☐	508.5	0.30	55	10.82	272.2	53.52
✖	Place	North Prairie	⇄	☐	1,812.2	1.06	188.9	10.42	194.8	10.75
✖	Place	Mukwonago	⇄	☐	5,185.9	3.03	538	10.37	769.6	14.84
✖	Place	Dousman	⇄	☐	1,709.5	1.00	171.2	10.01	185.8	10.87

Step 2: Explore Location Data

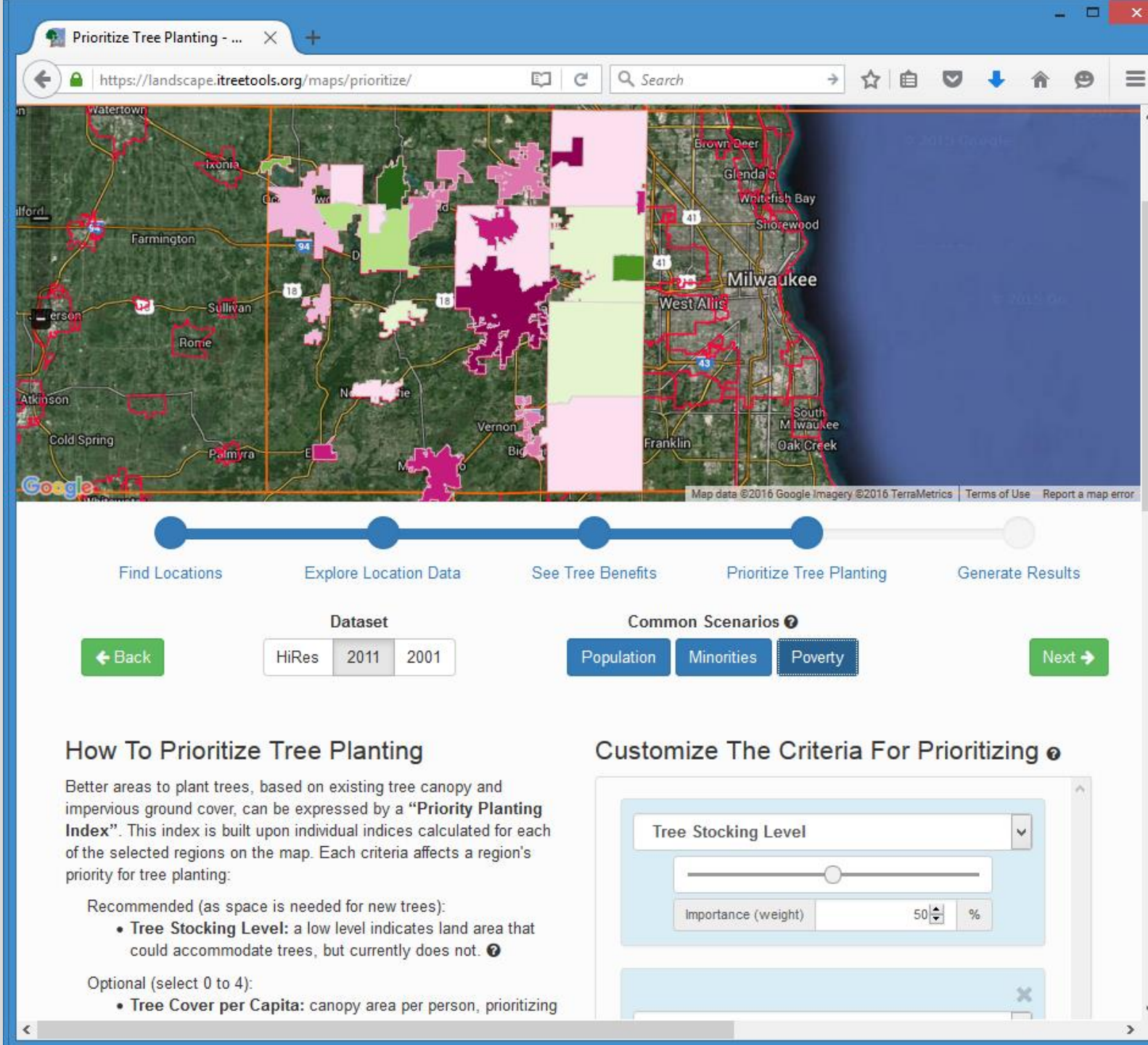


Step 3: Tree Benefits



Remove	Type	ID	Swap	Highlight	Transpiration (MG/yr)	Evaporation (MG/yr)	Rainfall Interception (MG/yr)	Avoided Runoff (MG/yr)	Avoided Runoff ($/yr)
✖	Place	New Berlin	⇄	☐	565.3	137.5	137.5	22.5	200,706
✖	Place	Chenequa	⇄	☐	141.9	39.1	39.1	0.8	7,034
✖	Place	Butler	⇄	☐	6	1.5	1.5	0.2	2,120
✖	Place	Pewaukee	⇄	☐	21.2	5.1	5.1	0.8	7,514
✖	Place	Waukesha	⇄	☐	200.8	48.8	48.8	8	71,295
✖	Place	Nashotah	⇄	☐	26.3	6.4	6.4	1	9,323

Step 4: Prioritize Tree Planting



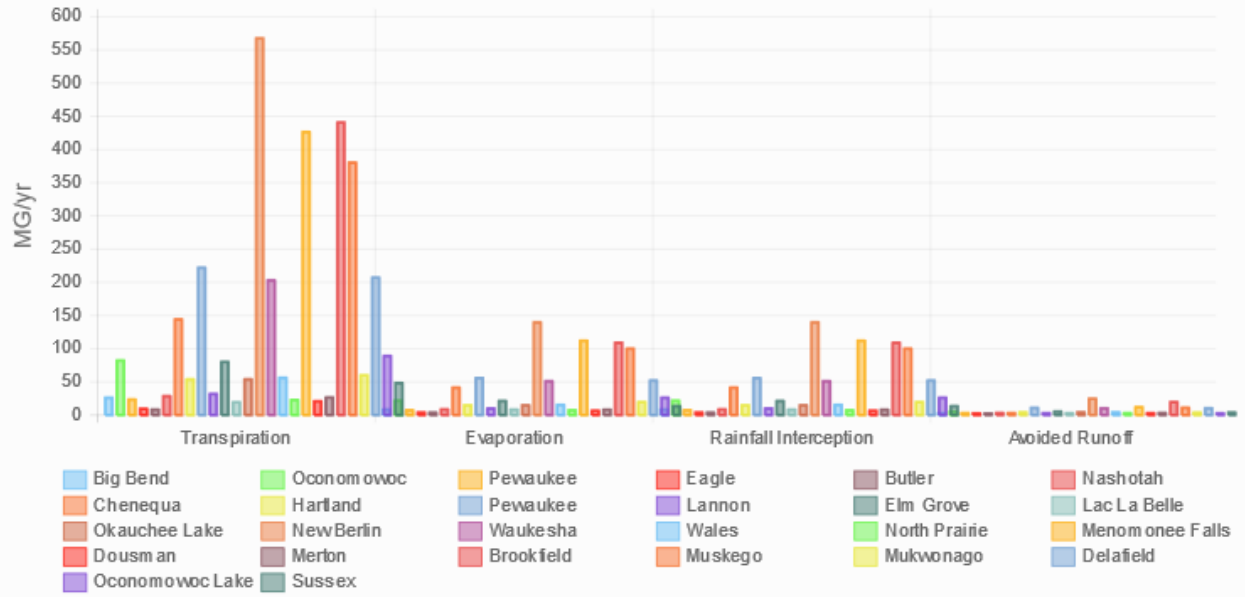
Step 5: Generate Reports

Report - i-Tree Landscape | Report - i-Tree Landscape | Google+

https://landscape.itreetools.org/report/0a2db23a-1f13-4e18-a217-4

Search

Hydrology



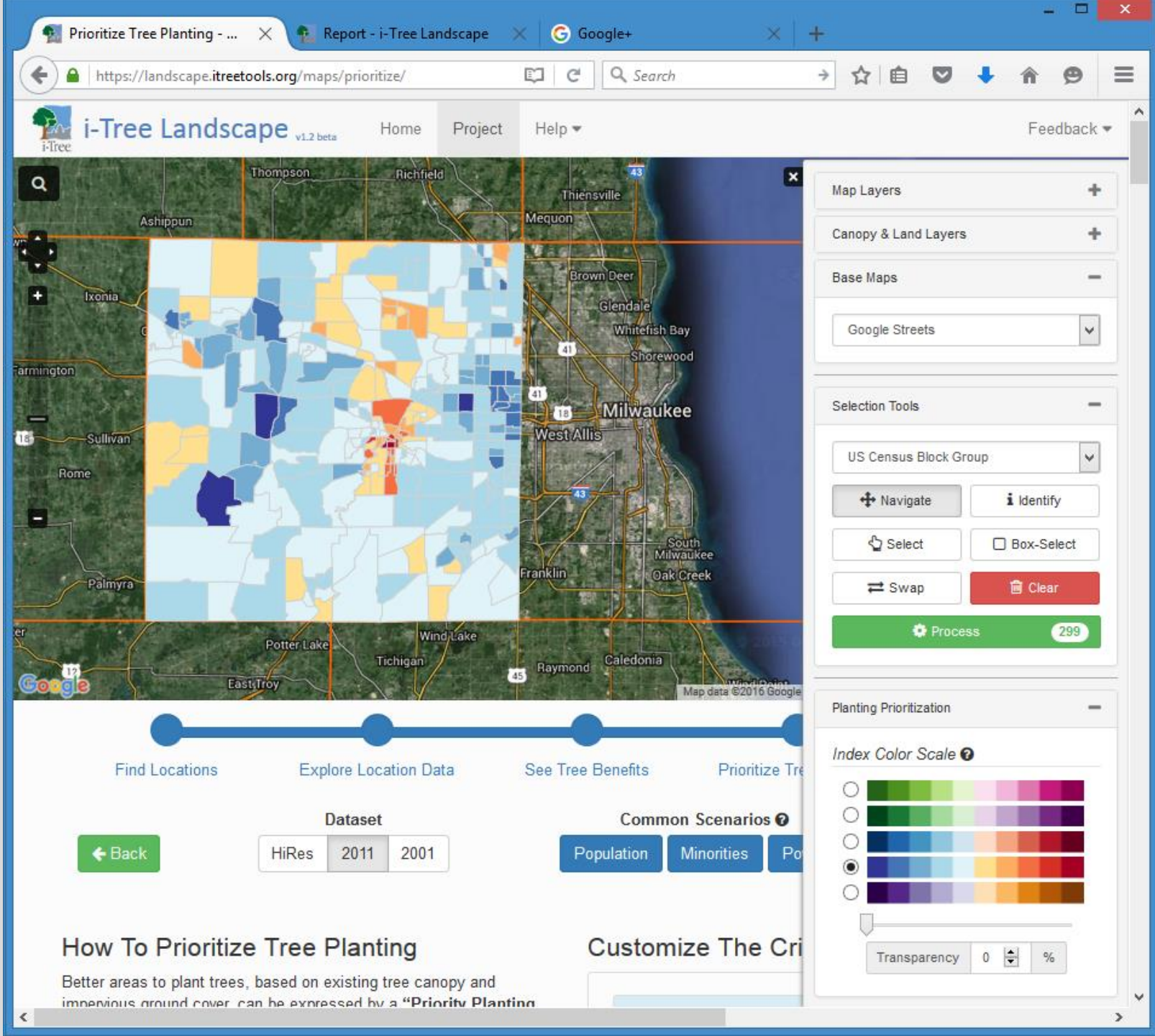
Share

Hydrology (2011 NLCD, Modeled Canopy Change = 0%)

Type	ID	Transpiration (MG/yr)	Evaporation (MG/yr)	Rainfall Interception (MG/yr)	Avoided Runoff (MG/yr)	Avoided Runoff ($/yr)
Place	New Berlin	565.3	137.5	137.5	22.5	200,706
Place	Brookfield	438.6	106.7	106.7	17.4	155,751
Place	Menomonee Falls	424.1	109.8	109.8	9.8	87,792
Place	Muskego	378.1	97.9	97.9	8.8	78,259
Place	Pewaukee	219.8	53.5	53.5	8.7	78,060
Place	Delafield	205	49.9	49.9	8.1	72,804
Place	Waukesha	200.8	48.8	48.8	8	71,295
Place	Oconomowoc	80	19.5	19.5	3.2	28,425
Place	Elm Grove	77.9	19	19	3.1	27,662
Place	Wales	53.9	13.1	13.1	2.1	19,138
Place	Hartland	51.7	12.6	12.6	2.1	18,366
Place	Okauchee Lake	51.7	12.6	12.6	2.1	18,349

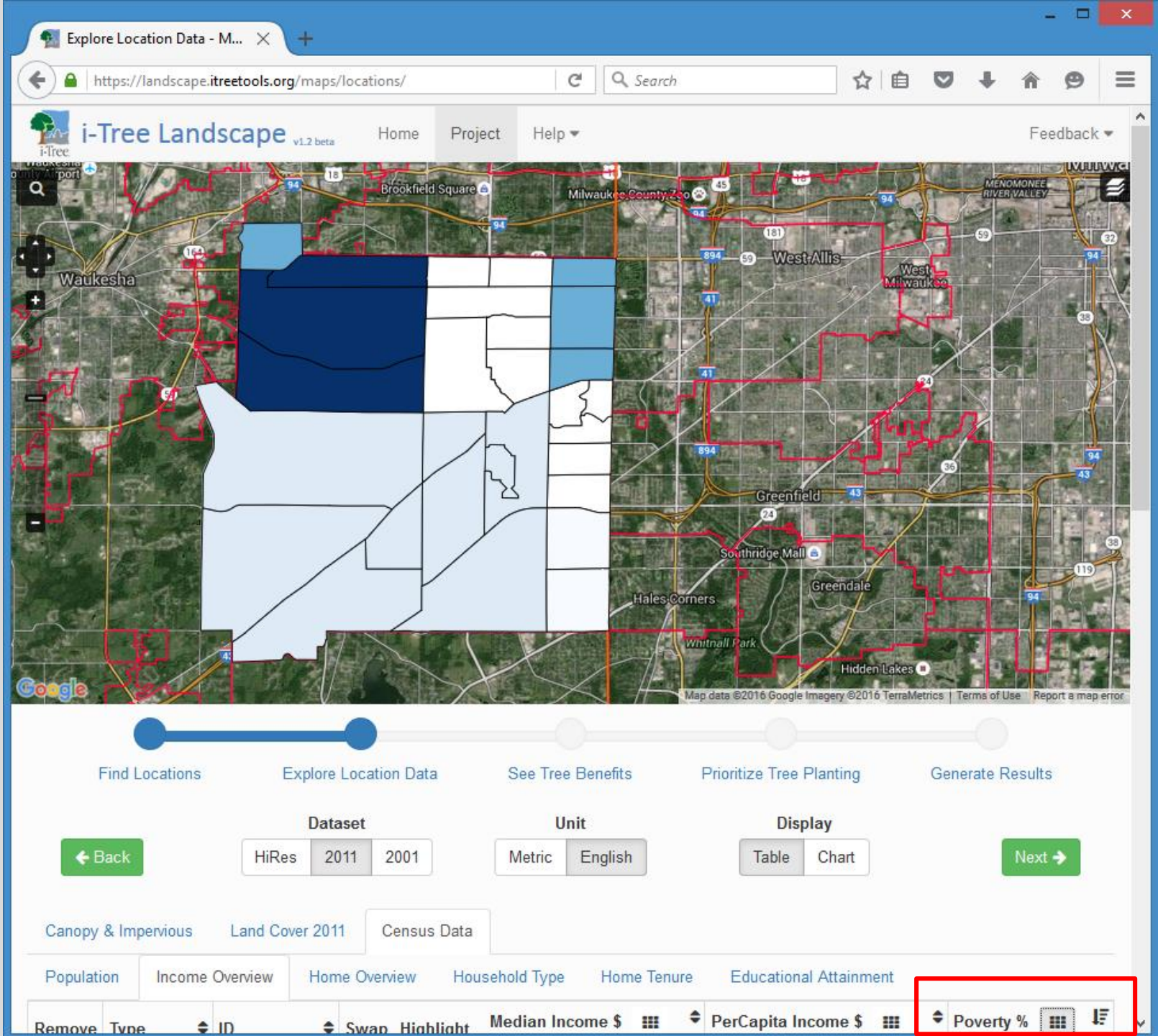
Explore Other Geographic Aggregations

Waukesha County by Census block



Explore Other Geographic Aggregations

New Berlin by Census block



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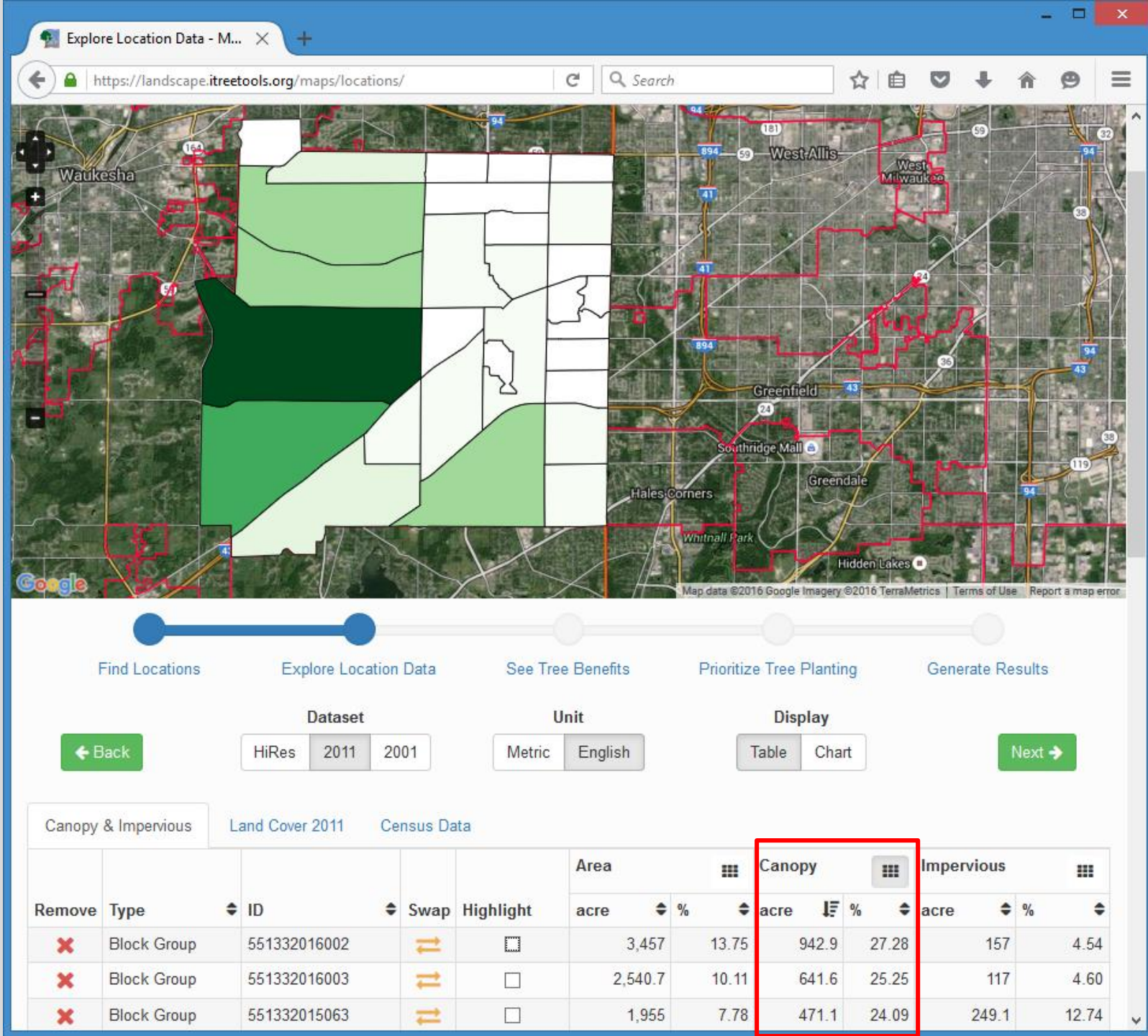
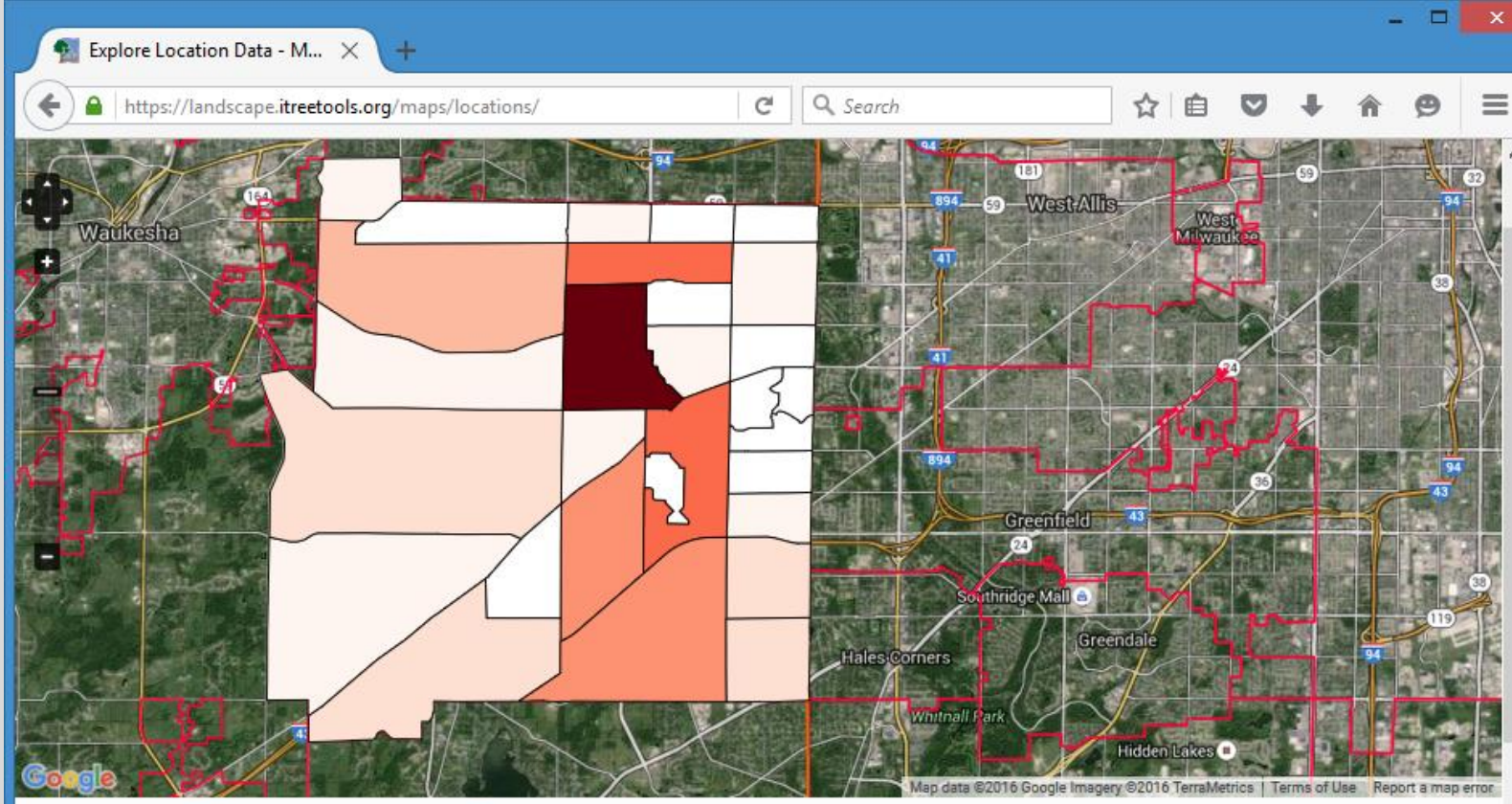
New Berlin by Census block



Explore Other Geographic Aggregations

New Berlin by Census block



Find Locations | Explore Location Data | See Tree Benefits | Prioritize Tree Planting | Generate Results

← Back

Dataset: HiRes | 2011 | 2001

Unit: Metric | English

Display: Table | Chart

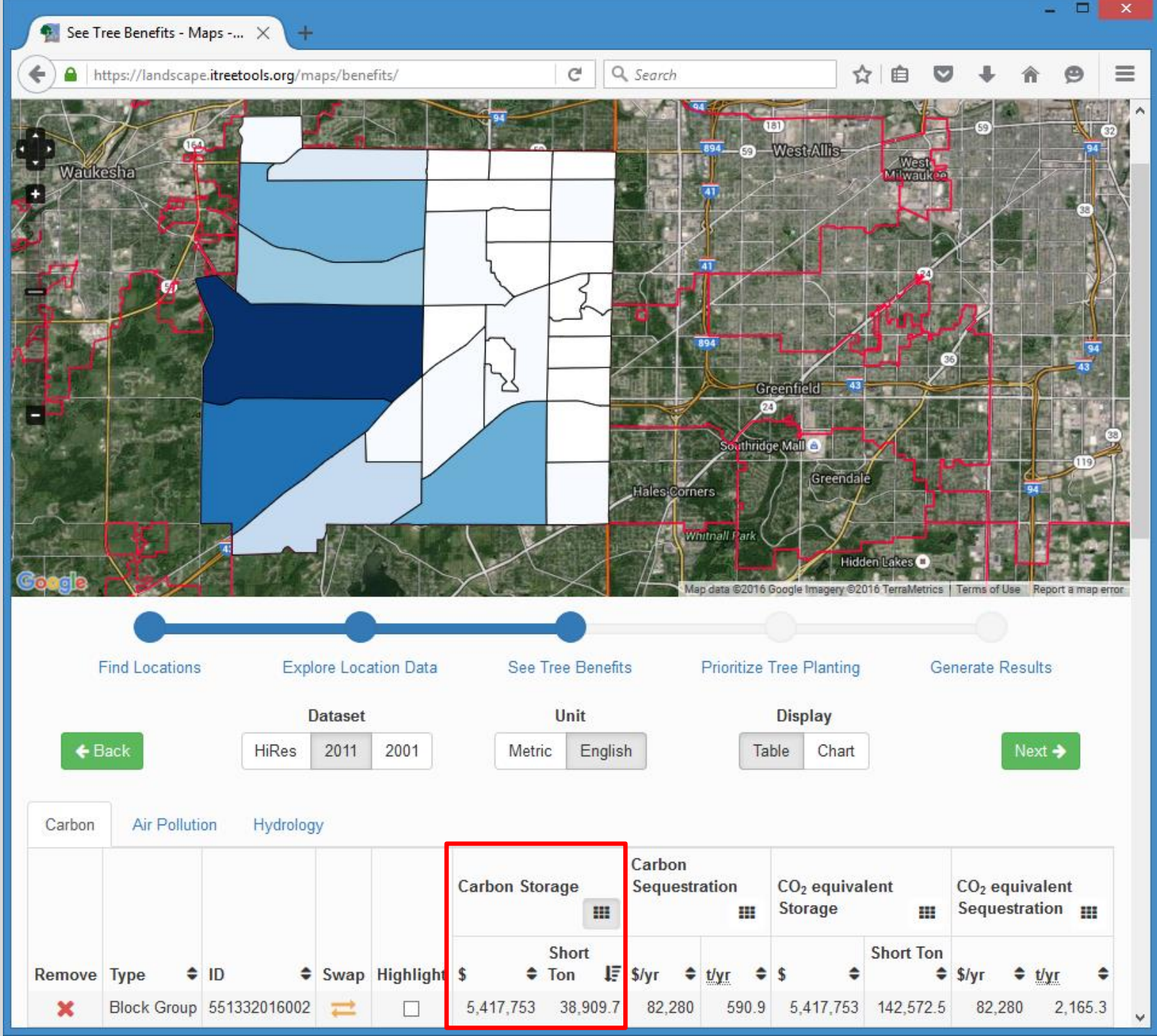
Next →

Canopy & Impervious | Land Cover 2011 | Census Data

Remove	Type	ID	Swap	Highlight	Area		Canopy		Impervious	
					acre	%	acre	%	acre	%
✖	Block Group	551332014042	⇄	☐	1,062	4.22	127.7	12.03	478.8	45.09
✖	Block Group	551332015061	⇄	☐	978.1	3.89	172.1	17.59	296.6	30.32
✖	Block Group	551332014033	⇄	☐	628.8	2.50	82	13.05	266.1	42.31

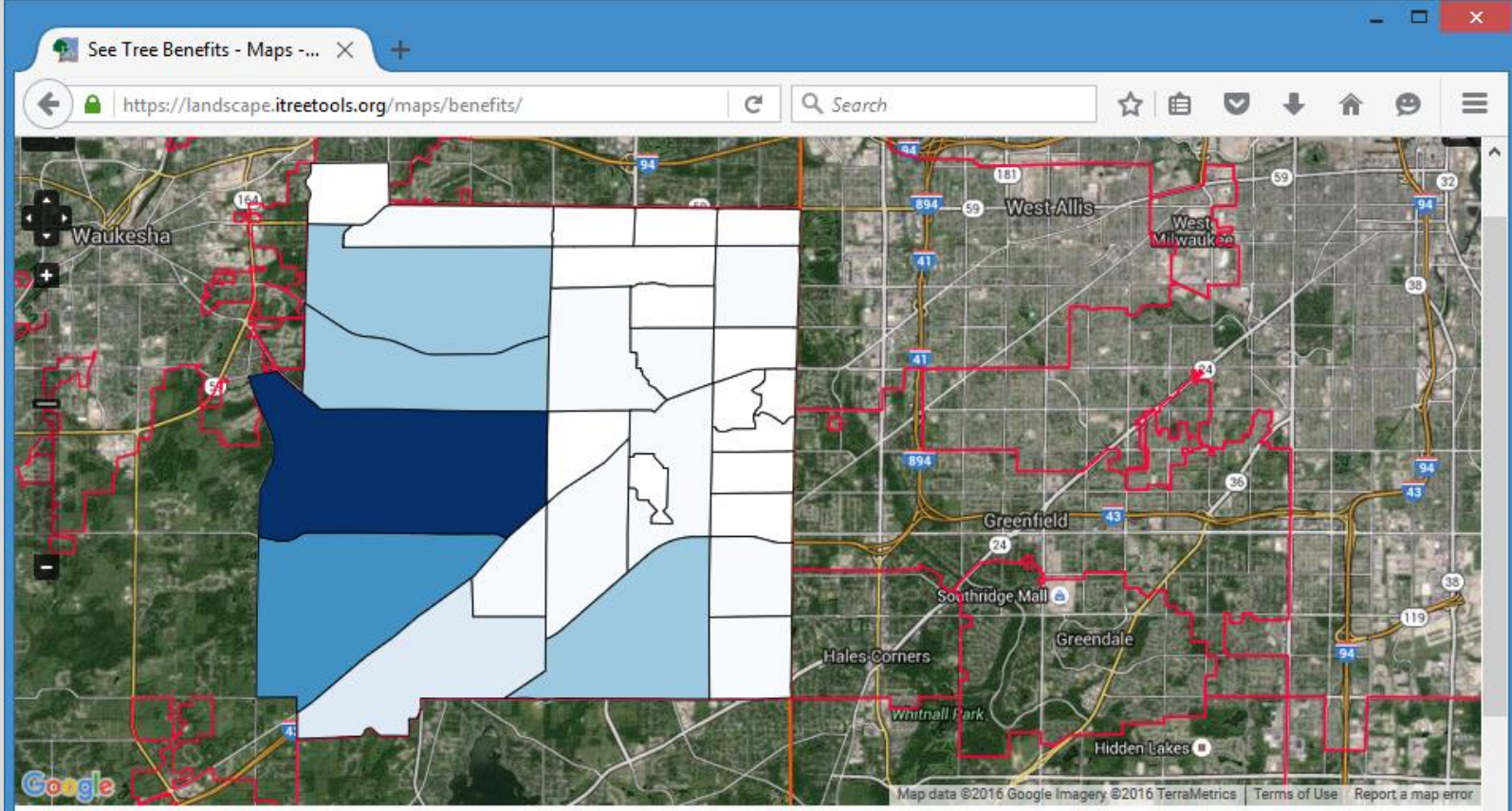
Explore Other Geographic Aggregations

New Berlin by Census block



Explore Other Geographic Aggregations

New Berlin by Census block



Find Locations | Explore Location Data | See Tree Benefits | Prioritize Tree Planting | Generate Results

Back

Dataset: HiRes | 2011 | 2001

Unit: Metric | English

Display: Table | Chart

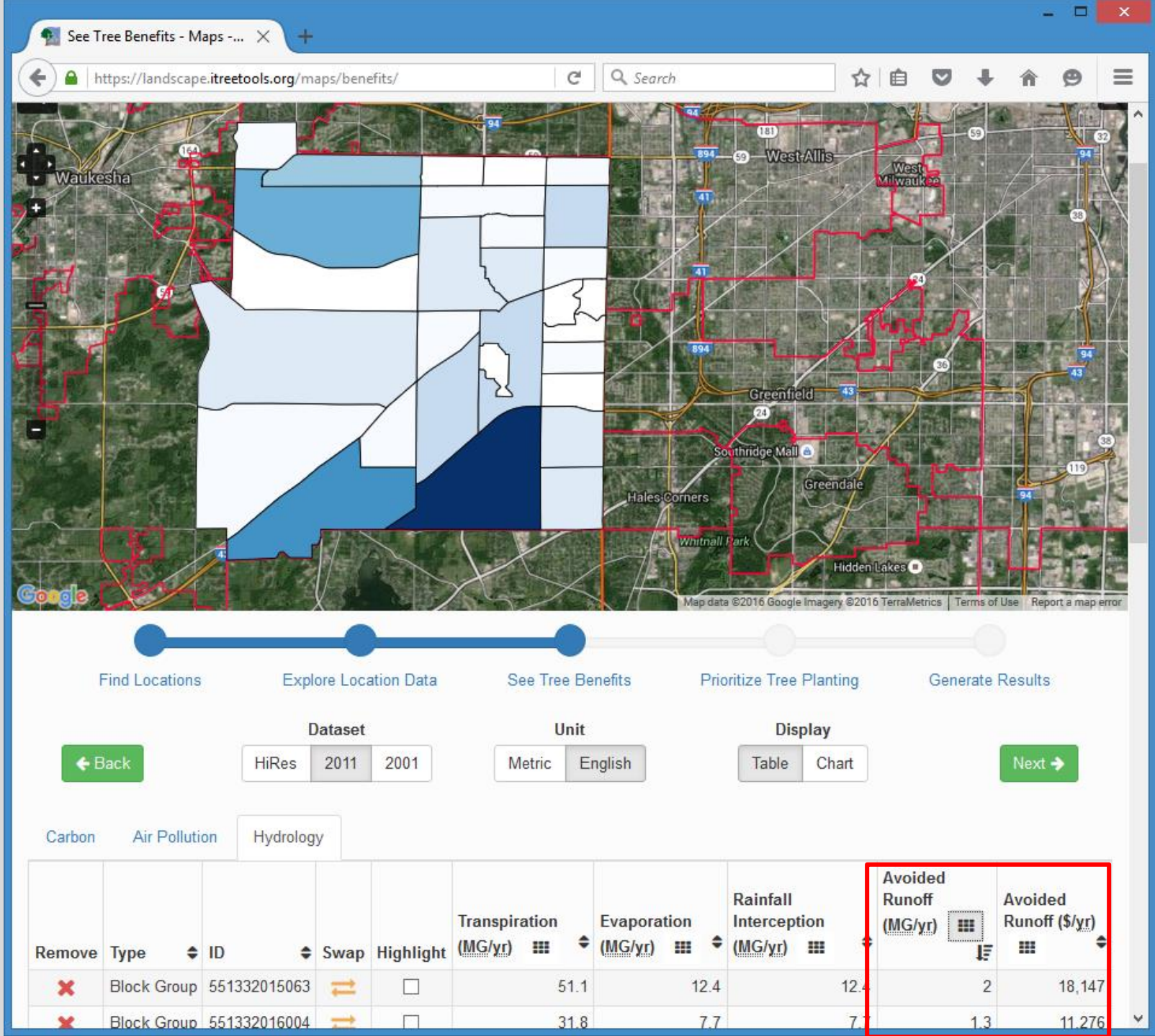
Next

Carbon | Air Pollution | Hydrology

Remove	Type	ID	Swap	Highlight	Transpiration (MG/yr)	Evaporation (MG/yr)	Rainfall Interception (MG/yr)	Avoided Runoff (MG/yr)	Avoided Runoff ($/yr)
✖	Block Group	551332016002	⇄	☐	96.2	26.5	26.5	0.5	4,768
✖	Block Group	551332016003	⇄	☐	65.5	18	18	0.4	3,245

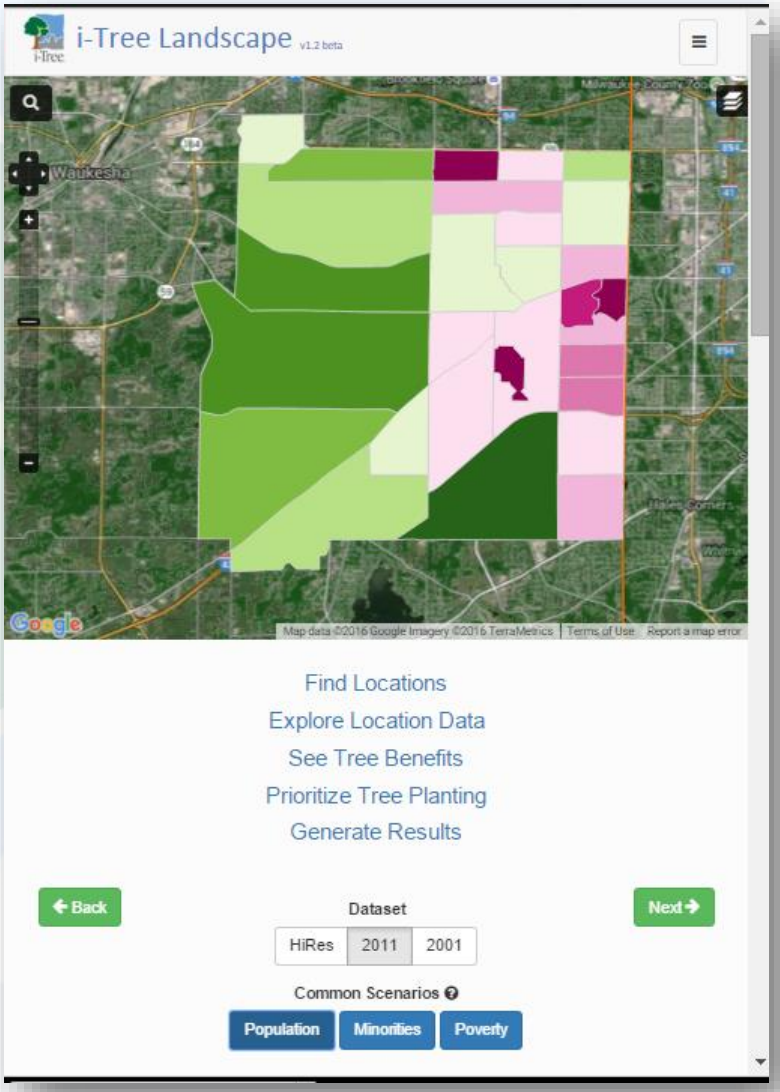
Explore Other Geographic Aggregations

New Berlin by Census block



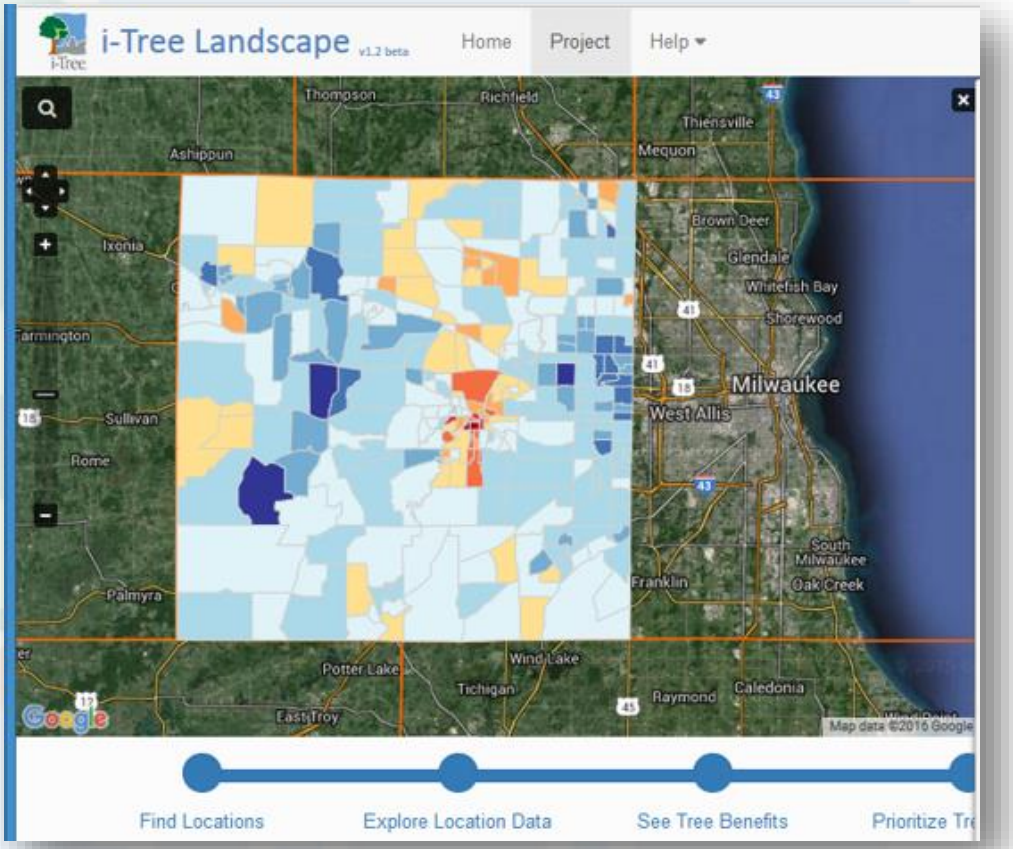
How can i-Tree Landscape help you?

- Demonstrate tree value to audiences
- Assess trees beyond streets and parks
- Protect & plant trees where they do the most good
- Justify tree maintenance, management and assessment.
- Explore how tree canopy impacts people



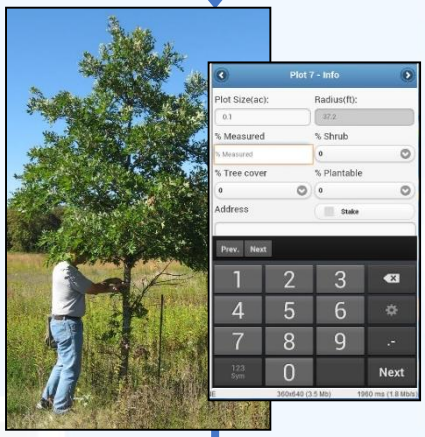
Who can benefit by using Landscape?

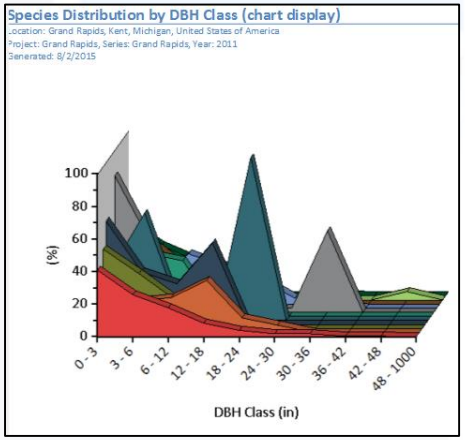
- Elected officials & decision makers
- Advocacy groups
- Sustainability groups
- Private consultants
- Tree care professionals
- Tree preservation groups
- UF Coordinators
- Educators



i-Tree Eco v6 update

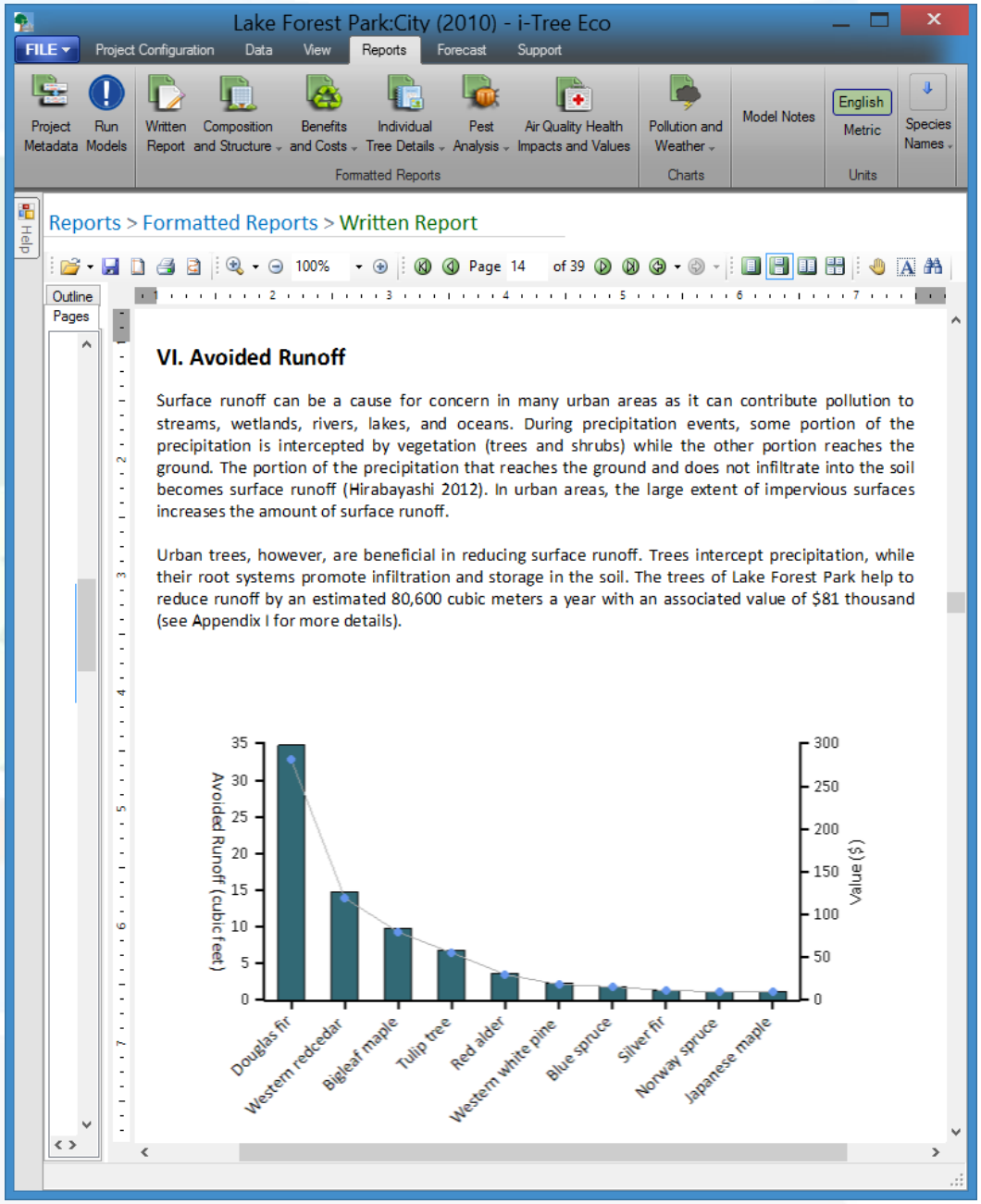
- Field-based assessment requiring sample or complete inventory data
- Flagship software based on latest science & local data
- Originally developed for assessing whole urban forest
- Adapted for individual tree assessments
- Reports structure, function, and value





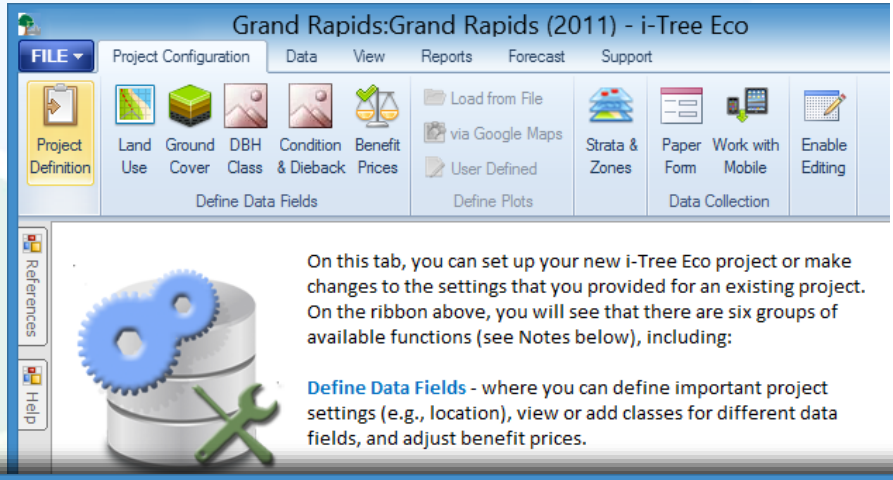
i-Tree Eco Assess:

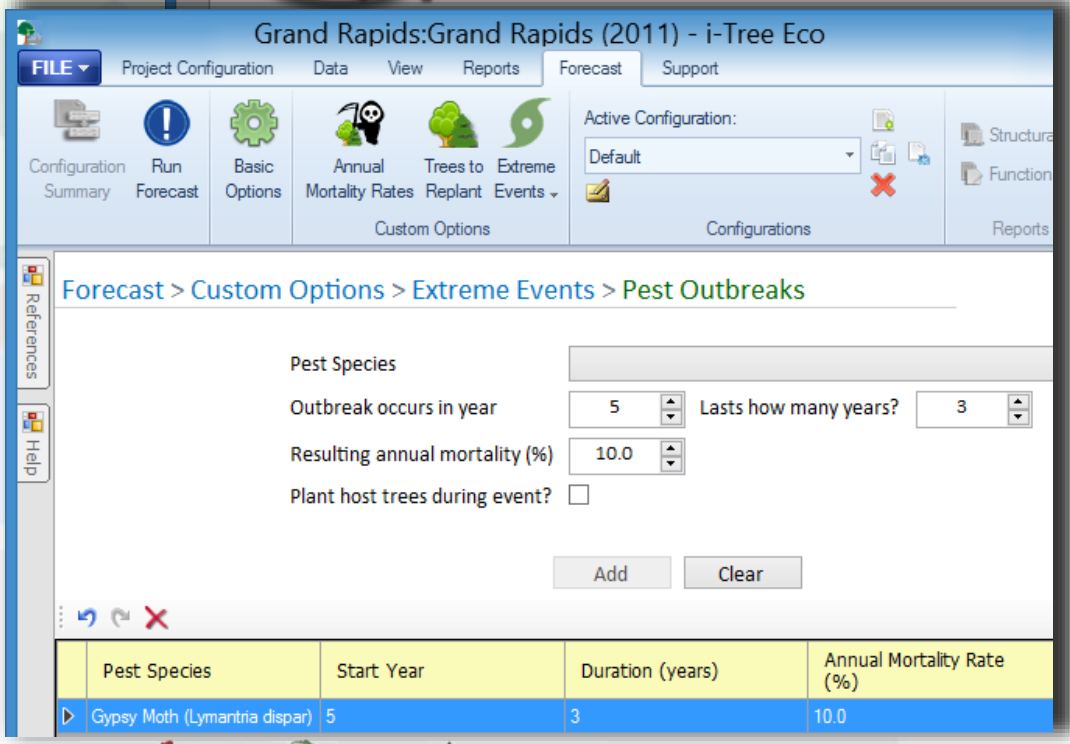
- Structure
- Function
  - Energy effects
  - Air quality
  - Carbon
  - Avoided runoff
  - Human health impacts
  - VOCs
- Value ($)
- Management info
  - Pest risk
  - Tree health
  - Exotic/invasive spp.



Eco v6 update highlights…

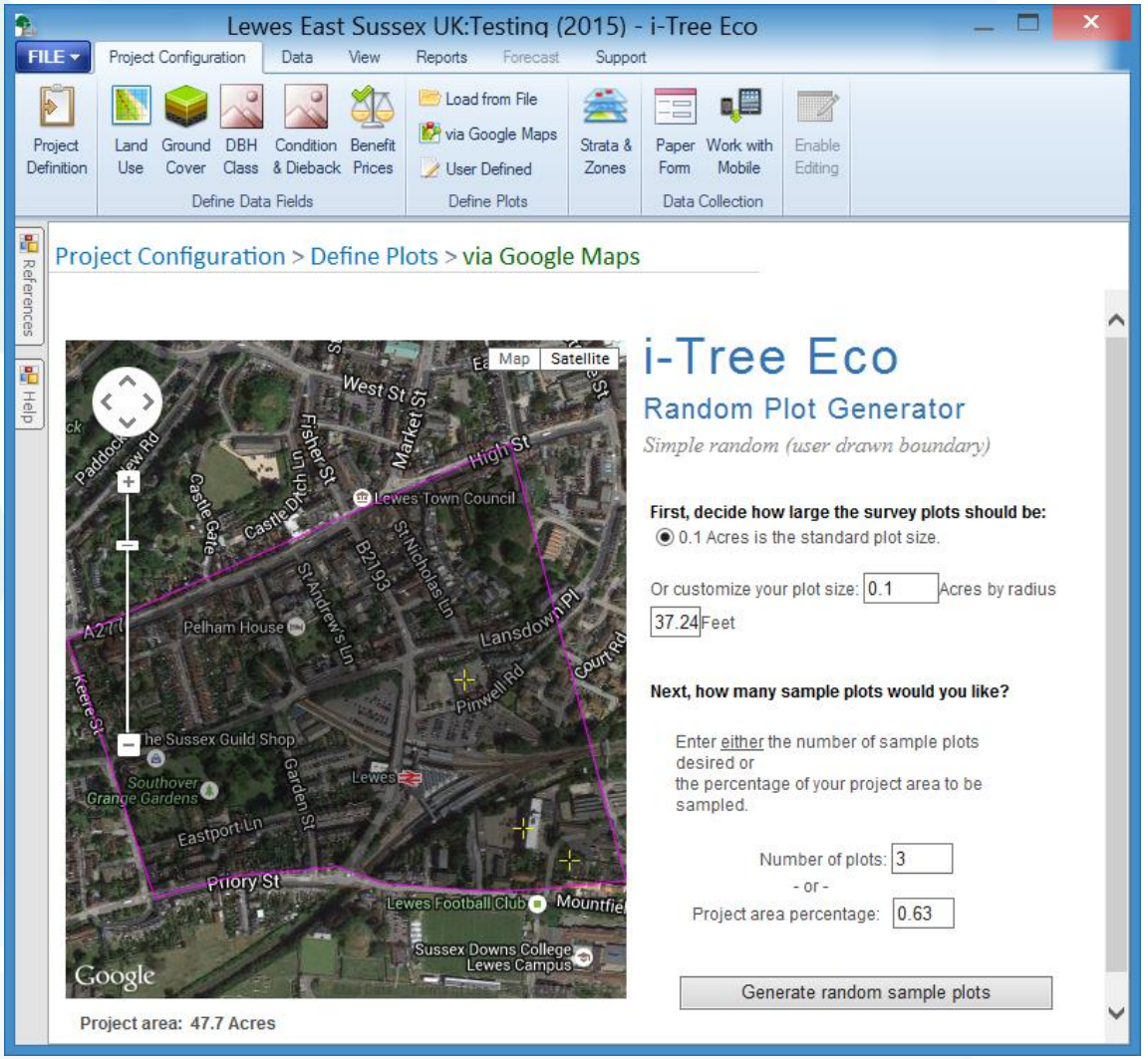
- New user interface design
- Multiple years of hourly pollution & weather data now available
- Simplified & new data collection options





Eco update highlights…

- Updated and expanded reporting options
- Forecasting capabilities
- Phase1 i-Tree Streets integration



Eco “Classic” Tree Data Variables

1. Tree species
2. Diameter at breast height DBH
3. Total tree height
4. Height to live top
5. Height to crown base
6. Crown width (N-S & E-W)
7. % Crown missing
8. Condition (% dieback)
9. Crown light exposure
10. Direction to building
11. Distance to building
12. Land use

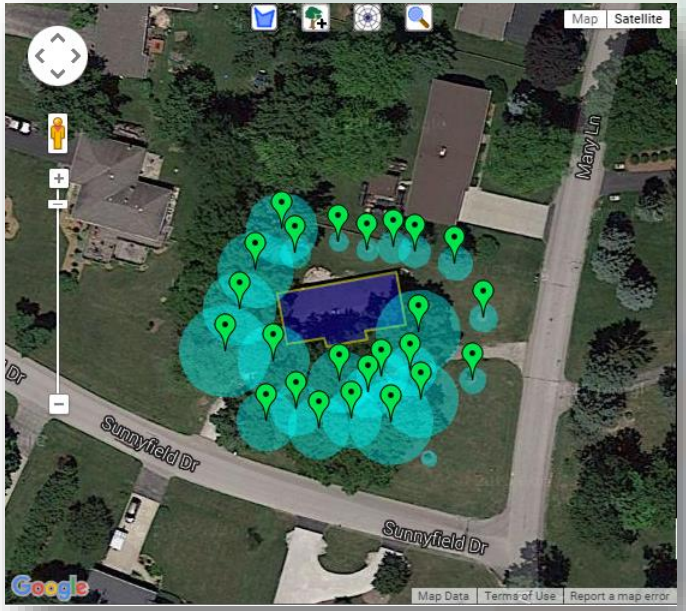
The 2016 i-Tree Suite of Tools

Web-based, run in your browser

Installed on a Windows desktop or laptop

DAVEY Arbor Day Foundation sma ISA Casey Trees ESF NAASF

Thank you!



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