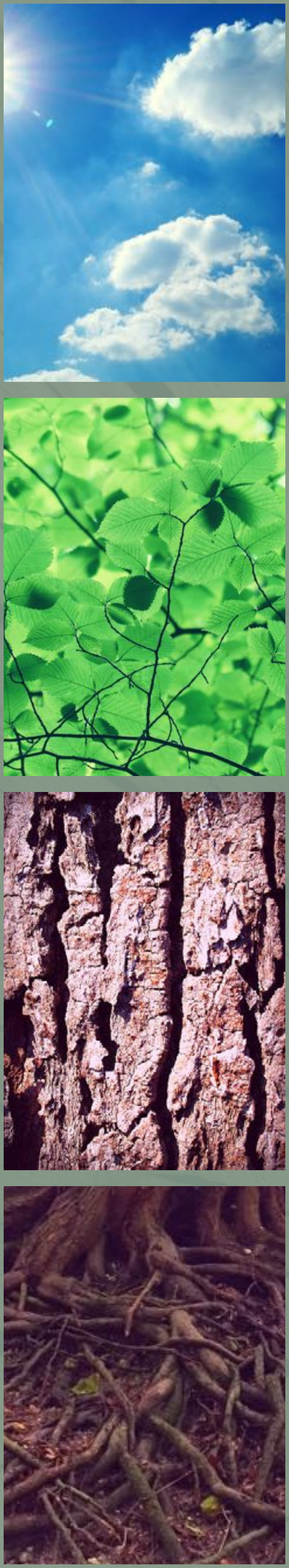
I-TREE LANDSCAPE AS A TOOL FOR CHANGE



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These guides were made in collaboration with the following partners below. All fellow tree lovers.

i-Tree Landscape

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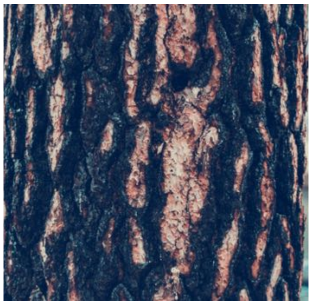

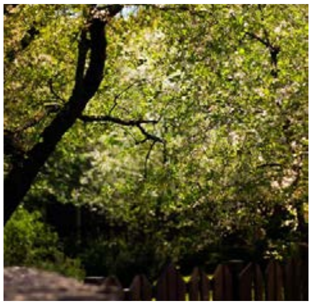

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WHY I-TREE LANDSCAPE?

Around the globe, people depend on urban ecosystems for cooling, air quality regulation, cultural identity, recreation and tourism, physical, and mental health (Wu 2014). Urban areas rely on the ecosystem services that green infrastructure like street trees and urban forests provide. These ecosystem services provide benefits to the environment, local ecosystems, and society at large, improving the livability of these regions.

i-Tree Landscape is a tool made by the USDA Forest Service and the Davey Tree Company that provides urban and community forest analysis and benefit assessment tools (iTree 2014). i-Tree Landscape is a peer-reviewed software suite that is free to use and offers state-of-the-art assessment tools for all. Learning how to use i-Tree tools can help communities learn more about their urban forest, quantify the benefits provided by trees, prioritize areas for additional tree planting based on a variety of factors (i.e. census or land use data), and investigate resilience of current planted areas to future climate changes. i-Tree Landscape visually assesses urban forest structures and ecosystem services via a web-based mapping interface, which can be grouped in different ways (e.g., counties, cities, census block groups, and watersheds). i-Tree Landscape is a tool for change that allows communities to take action in becoming more sustainable.

WHY I-TREE LANDSCAPE?

The World is Becoming More Urban

The amount of the world's population living in cities is increasing (UN, 2018). The future of ecological management in a broader sense may depend on the ability of people in cities to create and maintain urban ecosystem services. Urban forests need to be viewed as an important part of the economic and social fabric of the city (Nowak 2006). iAs our world and its natural landscapes are changing, many in the world will soon never see examples of organisms, habitats, or anything natural at all that cannot be found in cities. Despite this lack of familiarity with the natural world, a majority of future environmental decision making will be done in urban areas (Dunn et al., 2006). i-Tree Landscape provides a tool for visualizing and managing tree ecosystems in urban areas.

A Healthier City

There is growing evidence that suggests that surrounding oneself with nature and natural environments can help improve overall physical and psychological well being. Even passive viewing of parks or greenery creates positive attitudes, less stress, and increased attention (Hartig et al., 2014.) Increasing plant abundance can help decrease and control air pollution leading to positive effects in combating respiratory and heart diseases (Clark et al., 2014.) Exposure to diverse plant life and species richness has been shown to lead to lower allergy prevalences (Hanski et al., 2012) Chicago is currently dealing with the loss of trees due to emerald ash borer. In a study conducted by Donovon et al. (2013), this tree loss has led to increased mortality related to heart and lung illnesses across 15 states. Across these 15 states, emerald ash borer was associated with additional 6113 deaths related to illness of the lower respiratory system, and 15,080 cardiovascular-related deaths.

WHY I-TREE LANDSCAPE?

A Tool for Equity
Underprivileged communities typically do not receive as many social and environmental services as advantaged communities (Garcia-Cuerva et al., 2018). Ecosystems and ecosystem services are critical components to human well-being, particularly for the urban poor (Derkzen et al., 2017). Being able to identify underserved communities and the ecosystem services that best suit their needs can help address these inequities. i-Tree landscape is a useful tool for visually illustrating where there is a need for more ecosystem services from trees. By prioritizing tree planting based on areas with low tree cover or high poverty areas, i-Tree landscape can help cities, land managers, and communities to increase urban forests based on equity measures.

Combat Climate Change
Urban nature is increasingly recognized as an asset for climate change mitigation and adaptation (Demuzere et al. 2014). i-Tree landscape features forecast modeling based on projected future conditions and planting/management scenarios. Using this tool allows users to identify areas at high risk due to climate change. Being able to take preventative measures with one's urban forest is important and leads to money saved, communities being better served, and long-lasting ecosystem services.

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VISION

i-Tree Landscape is a tool with many uses. Because it is free, we hope that this guide inspires many to use it regularly and adapt it to fit the needs of different user groups. i-Tree landscape has immediate uses for forest managers and urban planners. In the future, however, we hope that i-Tree Landscape also becomes popularized beyond current practitioner circles. We see i-Tree Landscape as being particularly useful and important in community science and education. Use of i-Tree in these circles can be beneficial in bringing about equity in marginalized communities with less access to environmental education (and fewer resources to invest in data collection and analysis of the benefits/lack of benefits from urban trees).

Community Science

Learning how to use i-Tree Landscape provides opportunities for citizens to engage with others in their communities and to advocate for their needs. Community science allows citizens and community groups to document otherwise unnoticed or controversial environmental problems (Bonney et al., 2015) like gaps in urban tree cover. The goal of community science is to bridge the gap between the public and science, to facilitate a more active scientific role for the general public, and to increase dialogue and have more participatory decision-making in environmental policy creation (Irwin, 1995). Public involvement and volunteering has also been linked to strong advocacy for the environment (Ryan et al., 2001), essentially creating long-term environmental stewards.

VISION

Combatting “Ecophobia”

Combatting “Ecophobia”: In his book Beyond Ecophobia, David Sobel talks about how children can become scared when they learn about the many things happening in the environment (i.e. climate change or the degradation of the rainforest) and develop a kind of “ecophobia.” Being in a city where surrounding nature is not immediately thought of, ecophobia is likely more prominent. This is because classrooms are going to try to teach about lush environments such as the Amazon or the Arctic and try to create environmental stewards of children by encouraging them to take action in with these dire issues. Allowing children to love nature first, essentially building a foundational education around nature allows it to be more immersive.

Combatting Nature Deficit Disorder

Nature Deficit Disorder: In the US, outdoor activity was at 10% among children in 2003 (Soga & Gaston, 2016.) Robert Pyle stated that the “extinction of experience” was one of the biggest reasons for our environmental challenges. Disconnect with nature leads to an overall apathy and lack of environmental awareness. The term nature-deficit disorder was coined by Robert Louv in his book Last Child in the Woods, and is the idea that people, especially children, are spending too little time outdoors. Louv believes that this change results in a wide range of behavioral problems in children that are “human costs of alienation from nature: diminished use of the senses, attention difficulties, higher rates of physical and emotional illnesses, a rising rate of myopia, child and adult obesity, Vitamin D deficiency, and other maladies.”

VISION

Forestry in Education

Forestry is an important field, especially as climate change and urbanization are rapidly co-occurring. However, enrollment in university forestry programs is declining (Winistorfer,2005). Despite the fact that students are interested in the environment and the issues surrounding the environment, there is still a low interest in forestry (Hager et al., 2007). Integrating i-Tree landscape into educational activities and curriculum might prove valuable in increasing student interest in forestry, and in making lasting environmental stewards.

Creating Meaningful Relationships with Nature

By empowering and educating the youngest residents of our city, we are endowing a new generation of environmental stewards with knowledge and a meaningful relationship with nature within their urban home. Although interactions with nature are not the only route to interest in conservation, they are clearly an important and arguably necessary condition. Chawla (1999) states that one's "predisposition to take an interest in learning about the environment, feeling concern for it, and acting to conserve it," is based on "formative experiences" with nature. Robert Bateman said, "If you can't name things, how can you love them? And if you don't love them, then you're not going to care a hoot about protecting them or voting for issues that would protect them."

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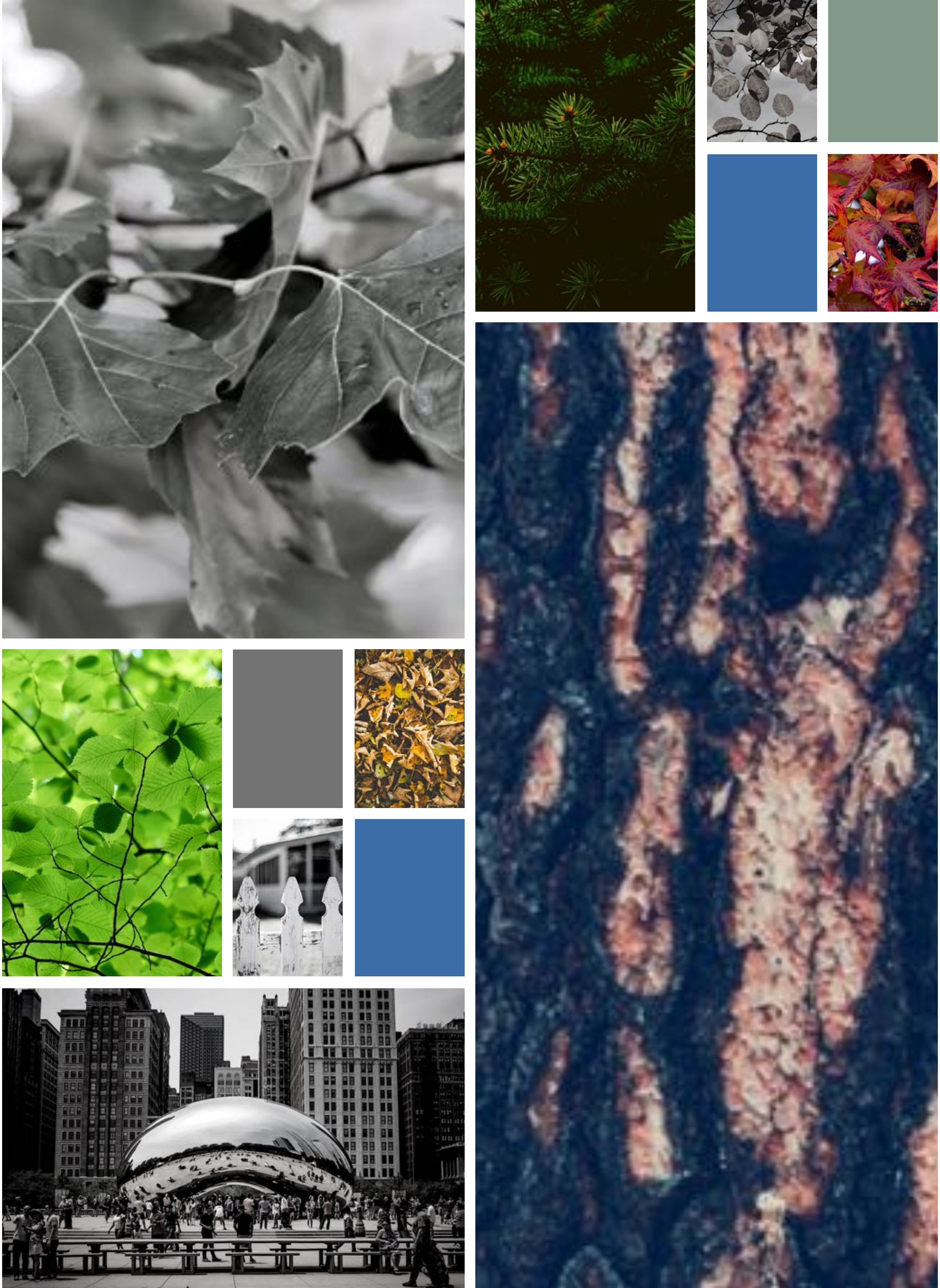


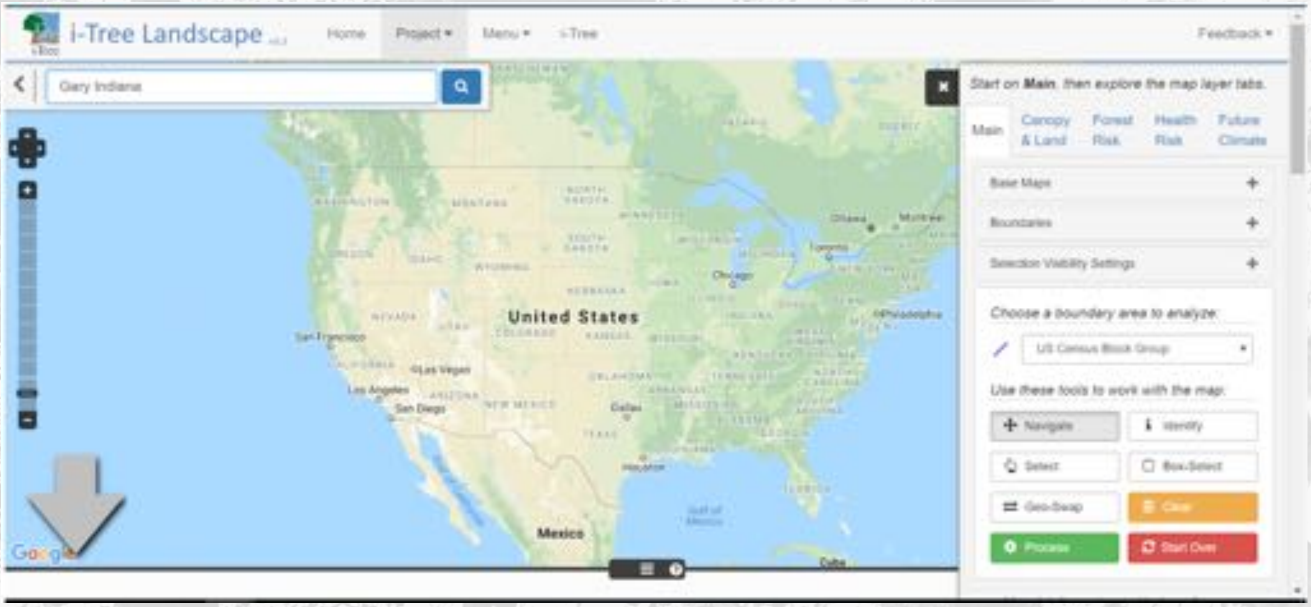
Evanston
Skokie
Oak Park
Berwyn
Chicago
Cicero
INDIANA
ILLINOIS
US
66
HISTORIC ROUTE
BEGINS

SELECT YOUR LOCATION

What makes i-Tree Landscape unique among other i-Tree tools is the absence of any significant data collection or input. This manual describes how to select the location for your project. Potential next steps are to Explore Location Data, See Tree Benefits, Prioritize Tree Planting, or explore different map layers.

SELECT YOUR LOCATION

1. To begin your project, type a location into the top left search bar.



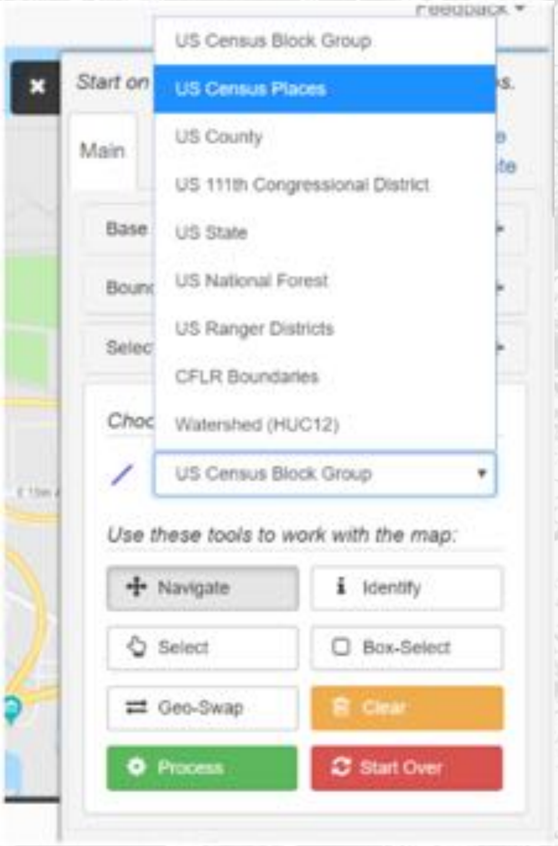
Gary Indiana

Choose a boundary area to analyze: US Census Block Group

i-Tree Landscape
Home
Project ▾
Menu ▾
i-Tree
Feedback ▾
Start on Main, then explore the map layer tabs.
Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Use these tools to work with the map:
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process
Start Over
United States
Mexico

2. Choose the boundary type for your location selection in the drop-down menu in the right control panel. Options include:

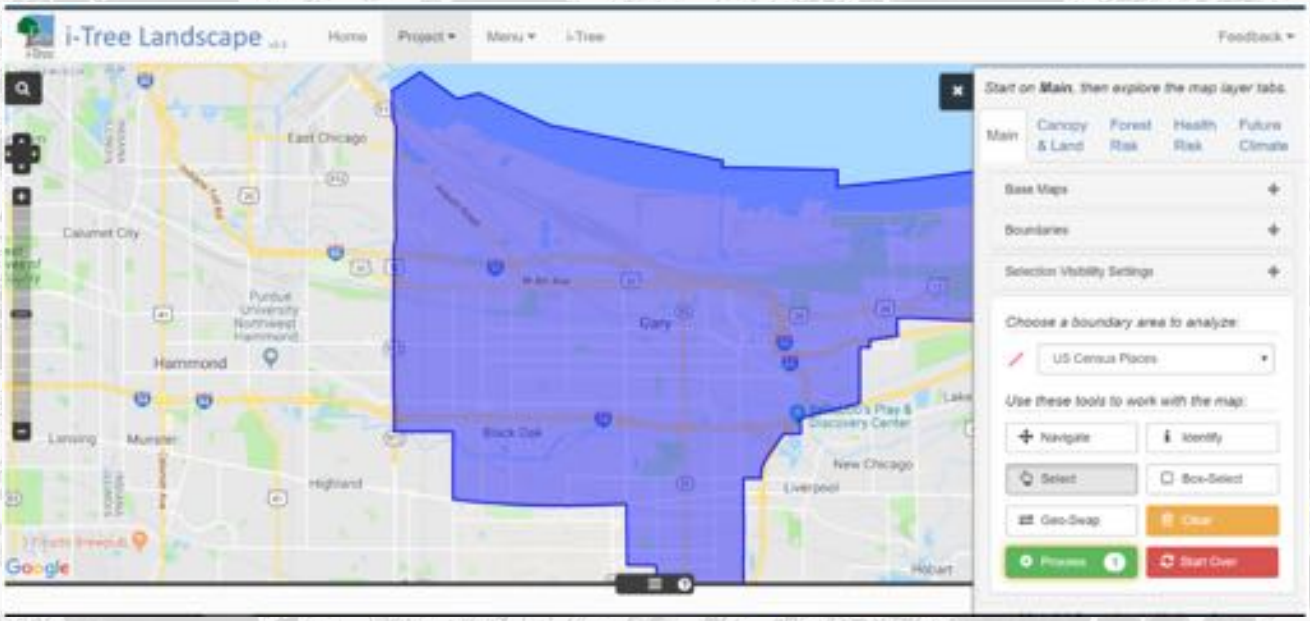
- **US Census Block Group**
- **US Census Places**
- **US County**
- **US 111th Congressional District**
- **US State**
- **US National Forest**
- **US Ranger Districts**
- **CFLR Boundaries**
- **Watershed (HUC12)**



Feedback ▾
Start on
Main
Base
Boun
Selec
Choo
US Census Block Group
US Census Places
US County
US 111th Congressional District
US State
US National Forest
US Ranger Districts
CFLR Boundaries
Watershed (HUC12)
US Census Block Group ▾
Use these tools to work with the map:
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process
Start Over

SELECT YOUR LOCATION

3. Click on the Select tool in the right control panel to choose your boundary area. Click on your desired location on the map. The selected boundary area should be highlighted in blue.



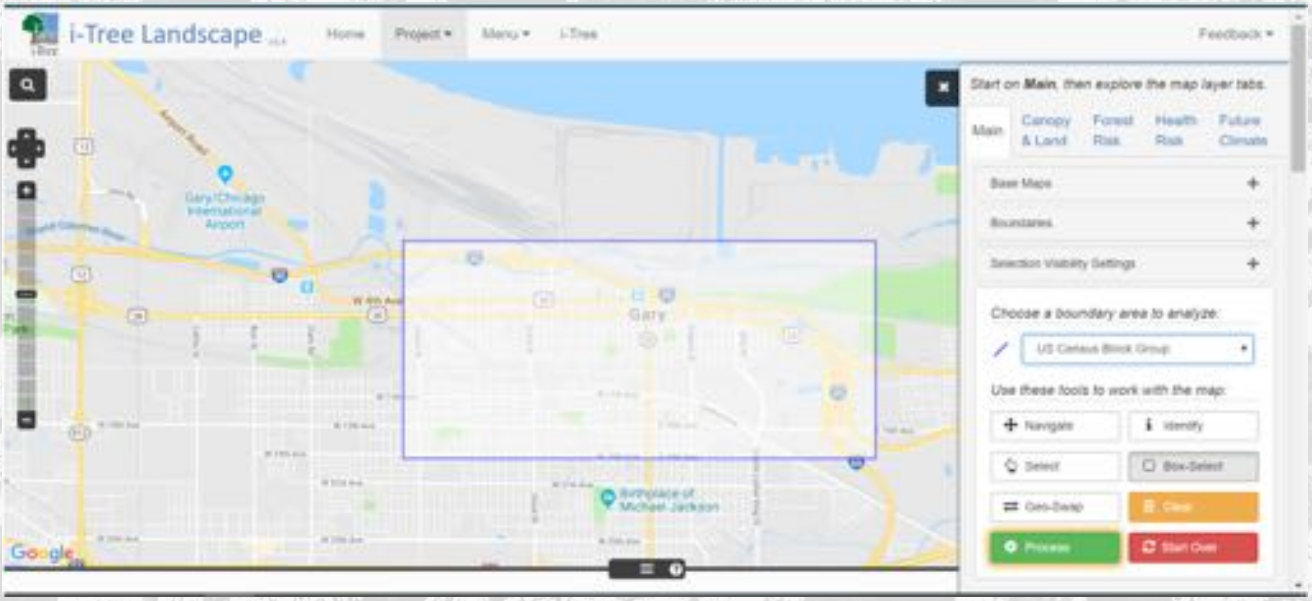
Start on Main, then explore the map layer tabs.

Choose a boundary area to analyze: US Census Places

Use these tools to work with the map:

i-Tree Landscape
Home
Project
Menu
i-Tree
Feedback
Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process
Start Over
East Chicago
Calumet City
Hammond
Gary
Lansing
Munster
Highland
Black Oak
New Chicago
Liverpool
Hobart
Google

You may also use the Box-Select tool to select all the regions that intersect with a drawn rectangle.



Start on Main, then explore the map layer tabs.

Choose a boundary area to analyze: US Census Block Group

Use these tools to work with the map:

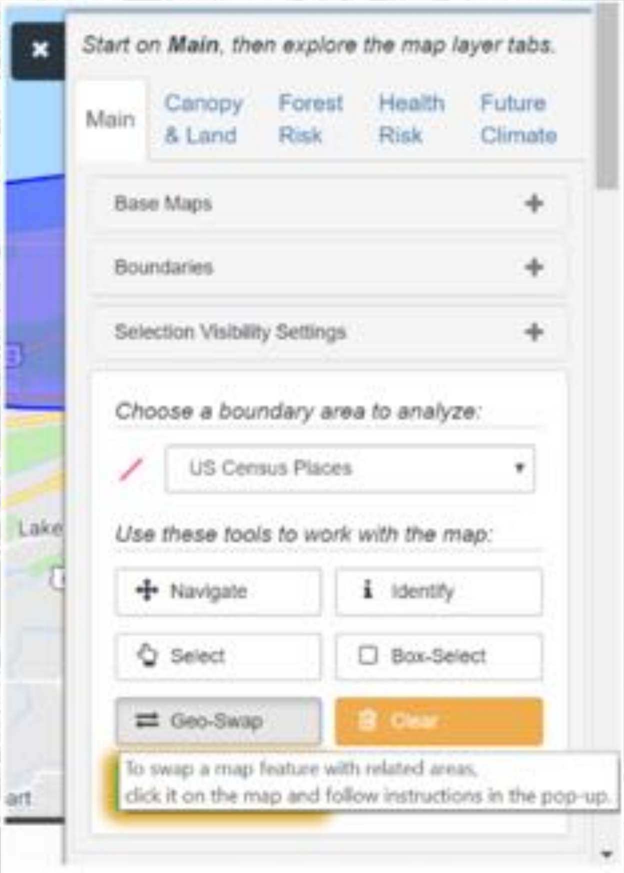
i-Tree Landscape
Home
Project
Menu
i-Tree
Feedback
Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process
Start Over
Gary/Chicago International Airport
W 4th Ave
Gary
Birthplace of Michael Jackson
Google

SELECT YOUR LOCATION

4. i-Tree Landscape allows you to easily switch to smaller or larger geographies that intersect with your selected boundary area.

For example, when a Census Place / is selected:
You can swap for smaller geographies (like Census Block Groups / it intersects). You can swap for larger geographies (like Congressional Districts / it intersects).

To do so, click on the Geo-Swap tool in the control panel.



×
Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps +
Boundaries +
Selection Visibility Settings +
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Lake
art

Start on **Main**, then explore the map layer tabs.

Choose a boundary area to analyze:

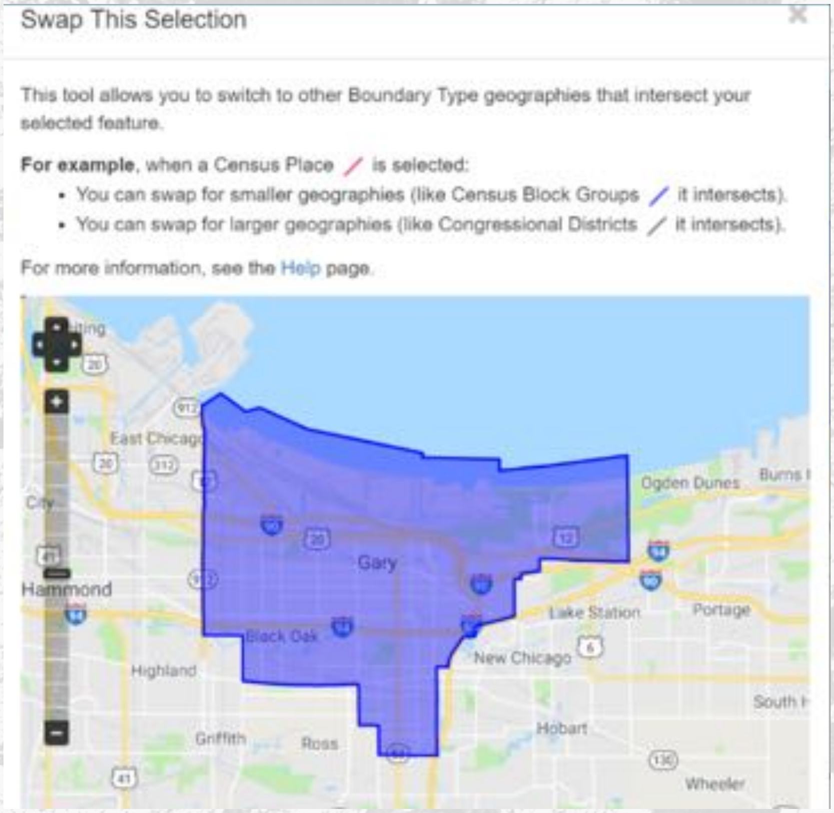
/ US Census Places

Use these tools to work with the map:

To swap a map feature with related areas, click it on the map and follow instructions in the pop-up.

SELECT YOUR LOCATION

5. Once the Geo-Swap tool is activated, click on your highlighted boundary area and this window should pop up.


Swap This Selection
Whiting
East Chicago
City
Hammond
Gary
Black Oak
Highland
Griffith
Ross
Ogden Dunes
Burns
Lake Station
Portage
New Chicago
Hobart
South
Wheeler

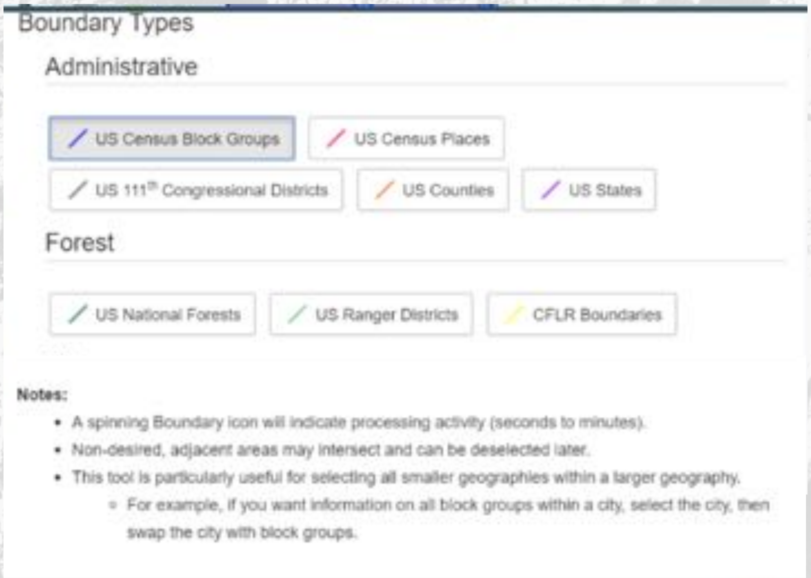
This tool allows you to switch to other Boundary Type geographies that intersect your selected feature.

For example, when a Census Place is selected:

- You can swap for smaller geographies (like Census Block Groups it intersects).
- You can swap for larger geographies (like Congressional Districts it intersects).

For more information, see the Help page.

6. Select a Boundary Type that you want to swap with the currently selected geography using the buttons in the Geo-Swap window. Press Okay to swap the original selection for the intersected features or Cancel to prevent any changes.

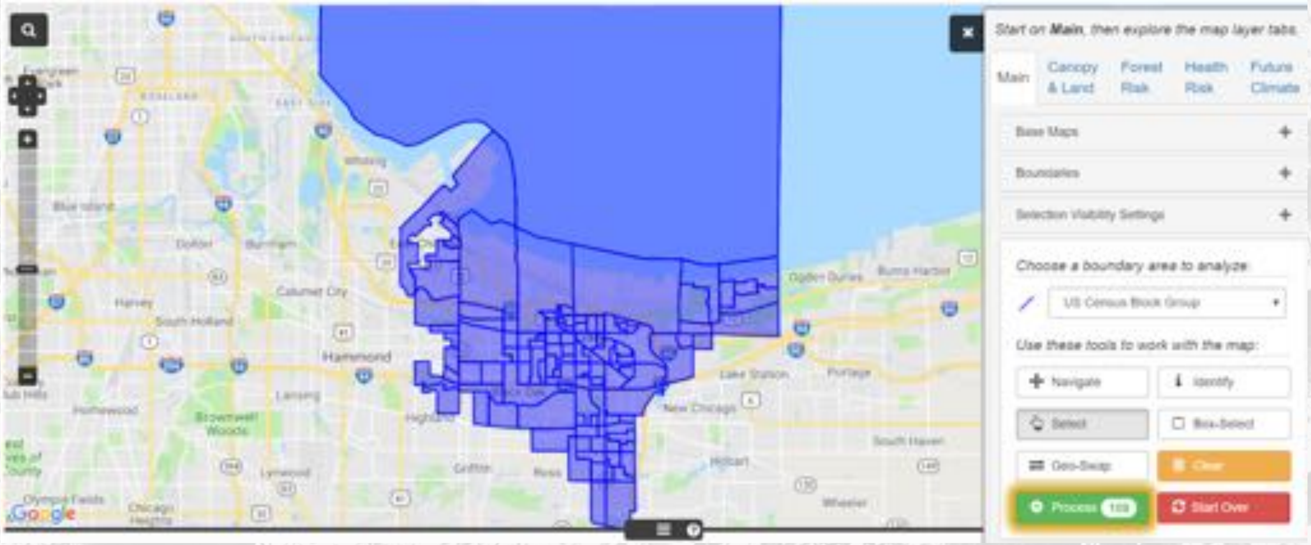

Boundary Types
Administrative
US Census Block Groups
US Census Places
US 111th Congressional Districts
US Counties
US States
Forest
US National Forests
US Ranger Districts
CFLR Boundaries

Notes:

- A spinning Boundary icon will indicate processing activity (seconds to minutes).
- Non-desired, adjacent areas may intersect and can be deselected later.
- This tool is particularly useful for selecting all smaller geographies within a larger geography.
    - For example, if you want information on all block groups within a city, select the city, then swap the city with block groups.

SELECT YOUR LOCATION

7. Your newly divided selected boundary area should be highlighted in blue (first picture). Using the Select tool in the control panel, deselect non-desired, adjacent areas (i.e. bodies of water) that intersect with your new boundary type (second picture).

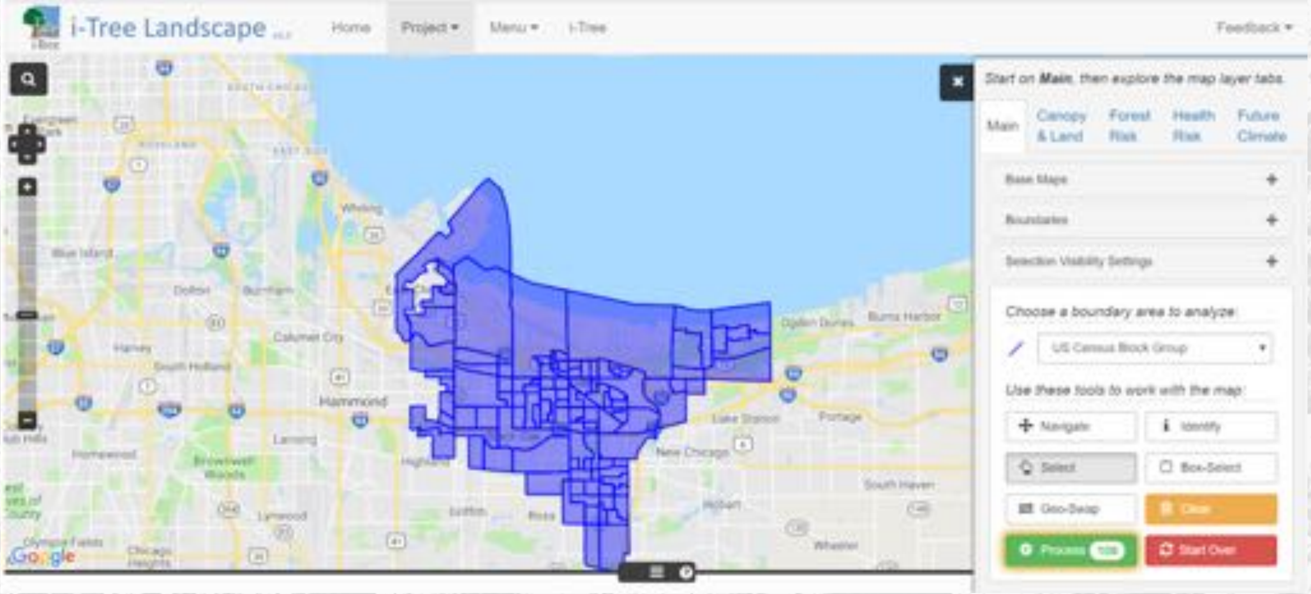


Start on Main, then explore the map layer tabs.

Choose a boundary area to analyze: US Census Block Group

Use these tools to work with the map:

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process
Start Over
Hammond
Calumet City
Harvey
South Holland
Lansing
Highland
Griffith
Lake Station
Portage
New Chicago
Hobart
Ogden Dunes
Burns Harbor
South Haven
Wheeler
Dolton
Blue Island
Homewood
Lynwood
Google



Start on Main, then explore the map layer tabs.

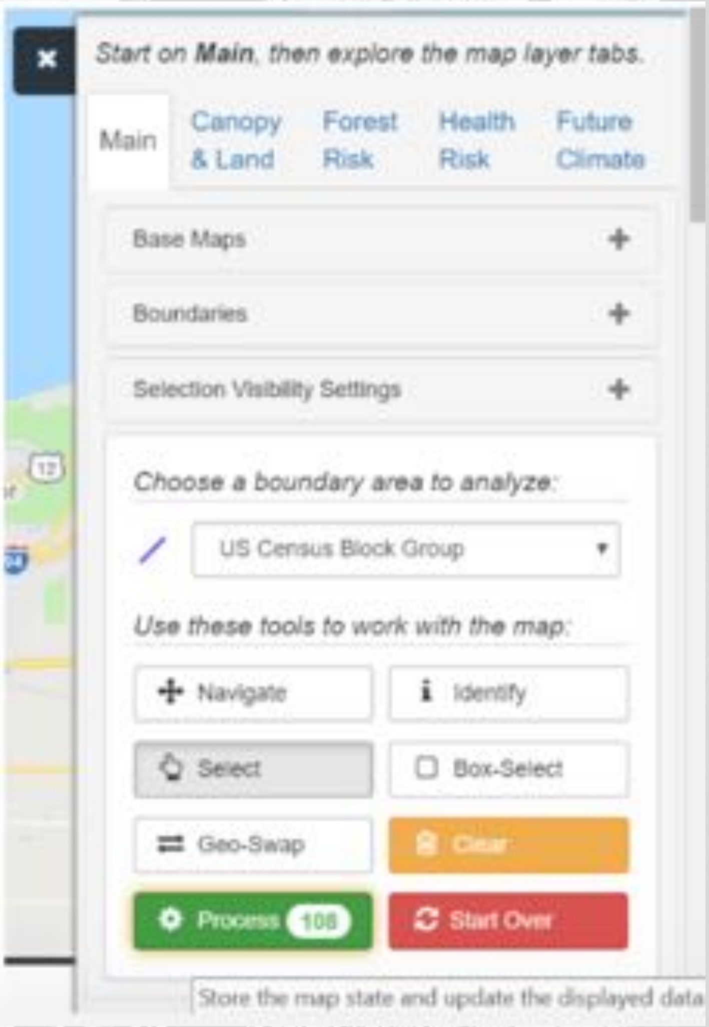
Choose a boundary area to analyze: US Census Block Group

Use these tools to work with the map:

i-Tree Landscape
Home
Project
Menu
i-Tree
Feedback
Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process
Start Over
Hammond
Calumet City
Harvey
South Holland
Lansing
Highland
Griffith
Lake Station
Portage
New Chicago
Hobart
Ogden Dunes
Burns Harbor
South Haven
Wheeler
Dolton
Blue Island
Homewood
Lynwood
Google

SELECT YOUR LOCATION

8. When you have successfully selected your desired location and boundary type, press the green Process button on the control panel to continue your project.



Start on **Main**, then explore the map layer tabs.

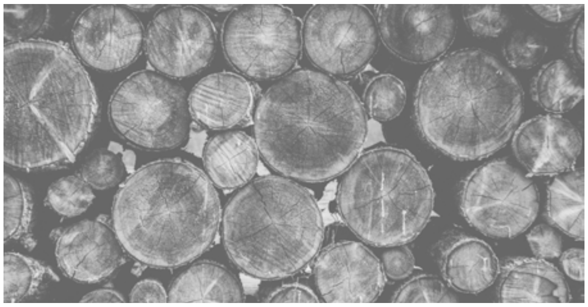
Choose a boundary area to analyze:

US Census Block Group

Use these tools to work with the map:

Store the map state and update the displayed data

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps +
Boundaries +
Selection Visibility Settings +
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process 108
Start Over



EXPLORE LOCATION DATA

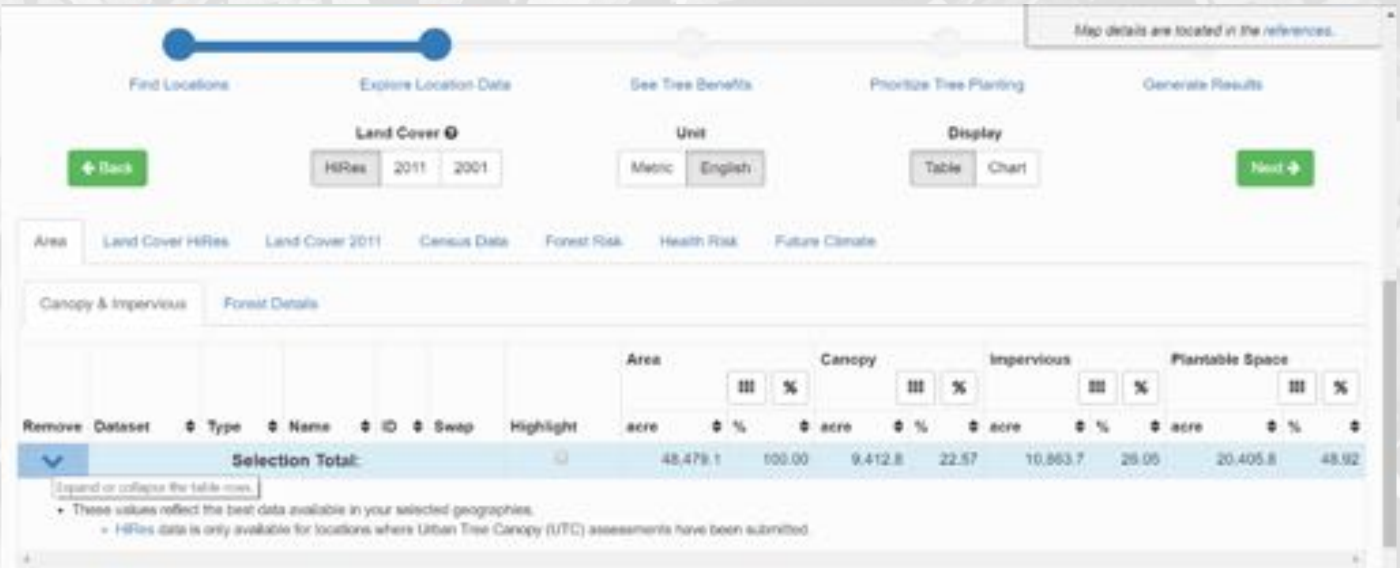
i-Tree Landscape provides a wide range of data for your desired project location including: Area, Forest Composition, Land Cover, Census Data, Forest Risks, Health Risks, and Future Climate predictions. This manual describes how to explore data from your selected geography. For instructions on how to ***Select Your Location***, see the manual titled Select Your Location. Potential next steps are to **See Tree Benefits, Prioritize Tree Planting, Other Map Layers, or Generate Results Report.**

EXPLORE LOCATION DATA

1. After selecting your location, you will be brought to the **Area** tab on the **Explore Location Data** page. Press the blue arrow under **Remove** to expand or collapse table rows.

- If you have multiple locations selected (i.e. several Census Block Groups), you will initially see your selection total. To see data for each location individually, expand table rows.

These values reflect the best data available in your selected geographies. High Resolution data is only available for locations where **Urban Tree Canopy (UTC)** assessments have been submitted.


Map details are located in the references.
Find Locations
Explore Location Data
See Tree Benefits
Prioritize Tree Planting
Generate Results
Land Cover
HiRes
2011
2001
Unit
Metric
English
Display
Table
Chart
Back
Next
Area
Land Cover HiRes
Land Cover 2011
Census Data
Forest Risk
Health Risk
Future Climate
Canopy & Impervious
Forest Details

Remove	Dataset	Type	Name	ID	Swap	Highlight	Area acre	Area %	Canopy acre	Canopy %	Impervious acre	Impervious %	Plantable Space acre	Plantable Space %
⌄			Selection Total:			☐	48,479.1	100.00	9,412.8	22.57	10,863.7	26.05	20,405.8	48.92

Expand or collapse the table rows.

- These values reflect the best data available in your selected geographies.
  - HiRes data is only available for locations where Urban Tree Canopy (UTC) assessments have been submitted.

EXPLORE LOCATION DATA

2. Most of the tabs on the Explore Location Data page have sub-tabs.

Under Area, there is:

- Canopy & Impervious
- Forest Details (Forest Type Groups and Top 10 Species by Basal Area)

Under Land Cover 2011, there is:

- Developed
- Forest
- Shrubland
- Herbaceous
- Planted/Cultivated
- Barren
- Wetlands
- Water

Under Census Data, there is:

- Population
- Income Overview
- Home Overview
- Household Type
- Home Tenure
- Educational Attainment

Under Forest Risk, there is:

- Wildfire Potential
- Hardiness Zones
- Pests

EXPLORE LOCATION DATA

Under Health Risk, there is:

- Air Quality
- UV
- Land Surface Temperature
- Drinking Water
- Non-Attainment Areas

Under Future Climate, there is:

- RCP 4.5 Model
- RCP 8.5 Model

Under each Future Climate model, there is another set of tabs with climate predictions for every decade from 2020 to 2100.

Definitions of many data headings (i.e. Developed, Open Space under Land Cover 2011) can be found by clicking on the heading.

Data details can be found at
https://landscape.itreetools.org/references/data/

3. Above the tabs on the Explore Location Data page, there are several options for how to display the data.

Under Land Cover, you may select:

- HiRes (if available)
- 2011
- 2001

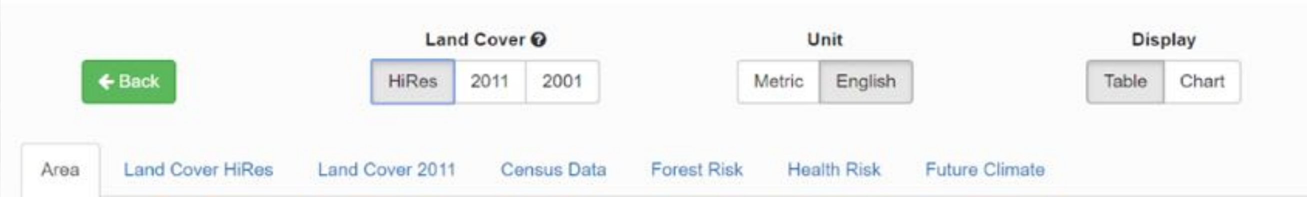
Under Unit, you may select:

- Metric
- English

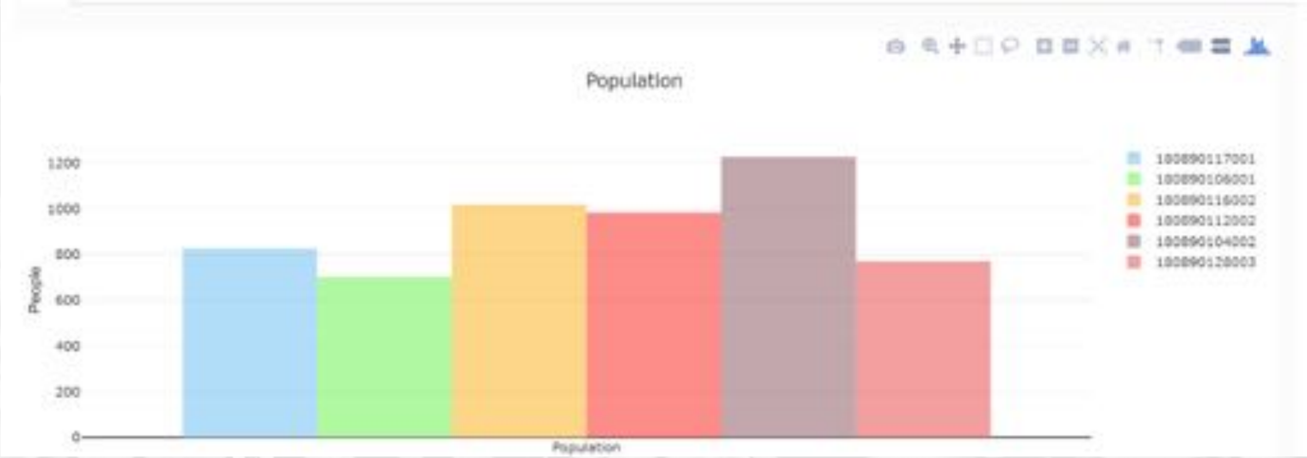
EXPLORE LOCATION DATA

Under **Display**, you may select:

- Table
- Chart

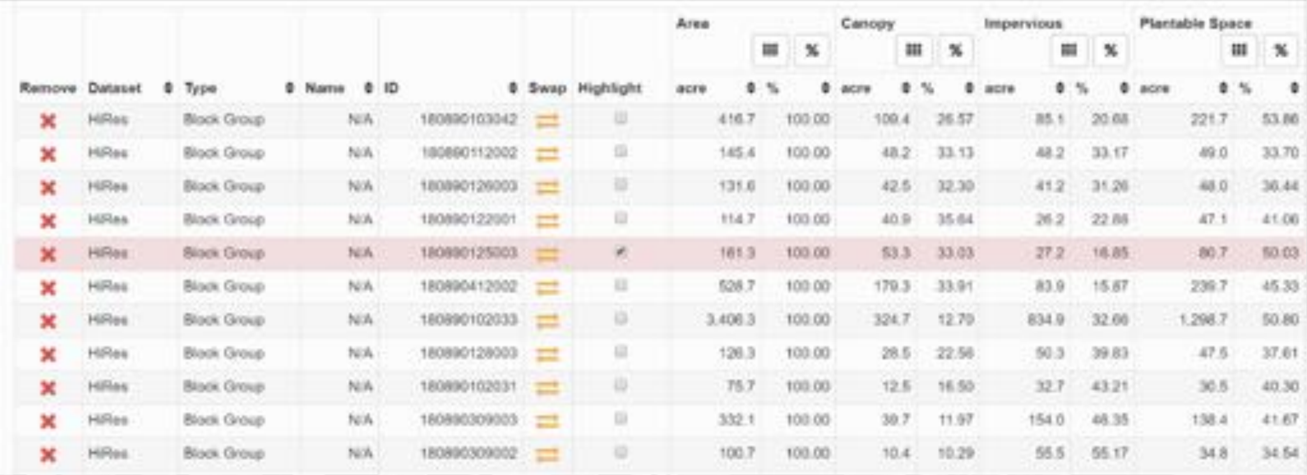

Land Cover
Unit
Display
Back
HiRes
2011
2001
Metric
English
Table
Chart
Area
Land Cover HiRes
Land Cover 2011
Census Data
Forest Risk
Health Risk
Future Climate

If you choose to display your data as a chart, hover over the chart area to see the charts toolbar.

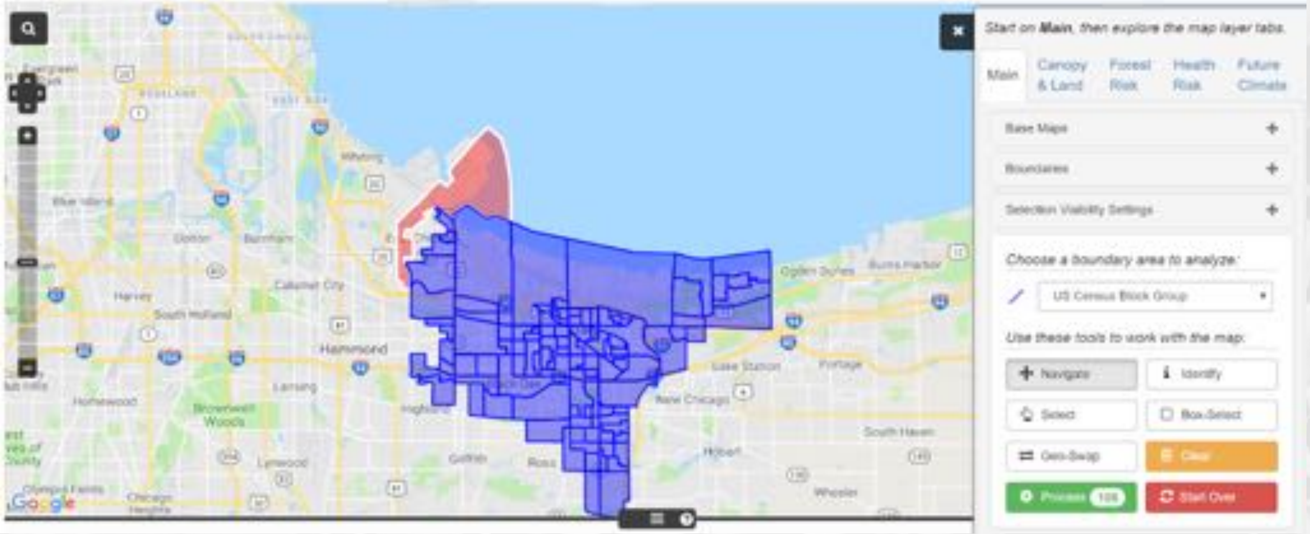

Population
People
1200
1000
800
600
400
200
0
Population
180890117001
180890106001
180890116002
180890112002
180890104002
180890128003

EXPLORE LOCATION DATA

4. To highlight a particular location out of many selected on the map, click the box in the **Highlight** column in that row (first picture). If you scroll back to the map, you should see that location highlighted in red (second picture)



							Area		Canopy		Impervious		Plantable Space	
Remove	Dataset	Type	Name	ID	Swap	Highlight	acre	%	acre	%	acre	%	acre	%
✗	HiRes	Block Group	N/A	180890103042	⇄	☐	416.7	100.00	109.4	26.57	85.1	20.68	221.7	53.86
✗	HiRes	Block Group	N/A	180890112002	⇄	☐	145.4	100.00	48.2	33.13	48.2	33.17	49.0	33.70
✗	HiRes	Block Group	N/A	180890126003	⇄	☐	131.6	100.00	42.5	32.30	41.2	31.26	48.0	36.44
✗	HiRes	Block Group	N/A	180890122001	⇄	☐	114.7	100.00	40.9	35.64	26.2	22.88	47.1	41.06
✗	HiRes	Block Group	N/A	180890125003	⇄	☑	161.3	100.00	53.3	33.03	27.2	16.85	80.7	50.03
✗	HiRes	Block Group	N/A	180890412002	⇄	☐	528.7	100.00	179.3	33.91	83.9	15.87	239.7	45.33
✗	HiRes	Block Group	N/A	180890102033	⇄	☐	3,406.3	100.00	324.7	12.70	834.9	32.66	1,298.7	50.80
✗	HiRes	Block Group	N/A	180890128003	⇄	☐	126.3	100.00	28.5	22.56	50.3	39.83	47.5	37.61
✗	HiRes	Block Group	N/A	180890102031	⇄	☐	75.7	100.00	12.5	16.50	32.7	43.21	30.5	40.30
✗	HiRes	Block Group	N/A	180890309003	⇄	☐	332.1	100.00	39.7	11.97	154.0	46.35	138.4	41.67
✗	HiRes	Block Group	N/A	180890309002	⇄	☐	100.7	100.00	10.4	10.29	55.5	55.17	34.8	34.54



Start on **Main**, then explore the map layer tabs.

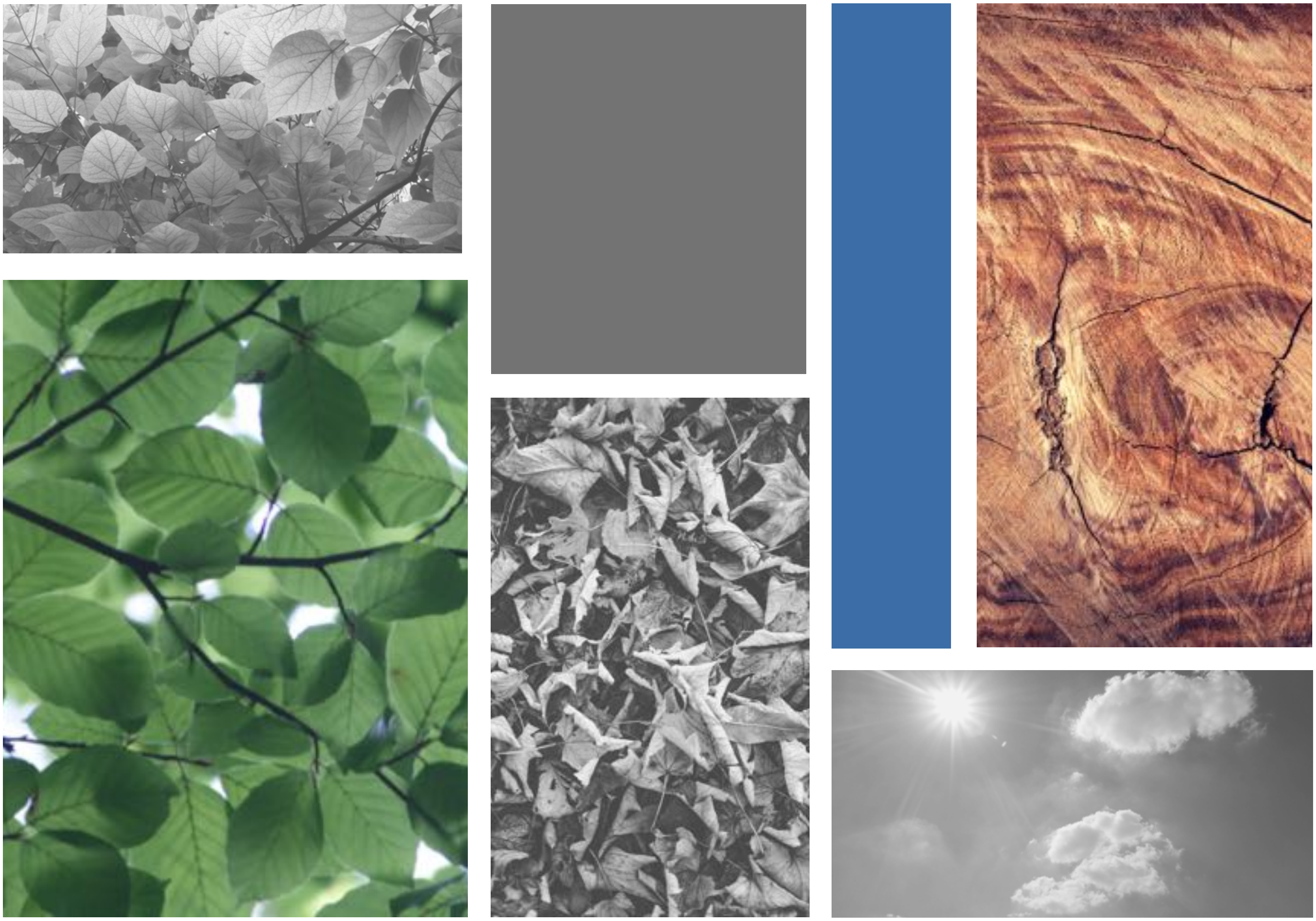
Choose a boundary area to analyze:

US Census Block Group

Use these tools to work with the map:

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process 108
Start Over
Whiting
Calumet City
Burnham
Dolton
Harvey
South Holland
Hammond
Lansing
Homewood
Highland
Griffith
Ross
Hobart
Lake Station
New Chicago
Ogden Dunes
Burns Harbor
Portage
South Haven
Wheeler
Lynwood
Google

5. To learn how to generate a report containing your location data, see the manual titled **Generate Results.**



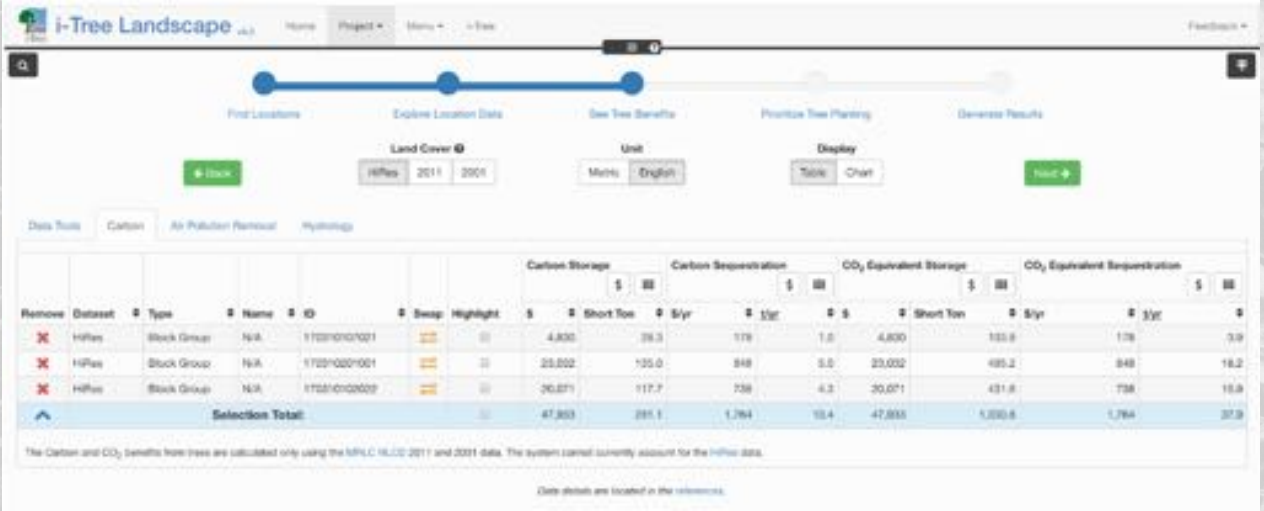
SEE TREE BENEFITS

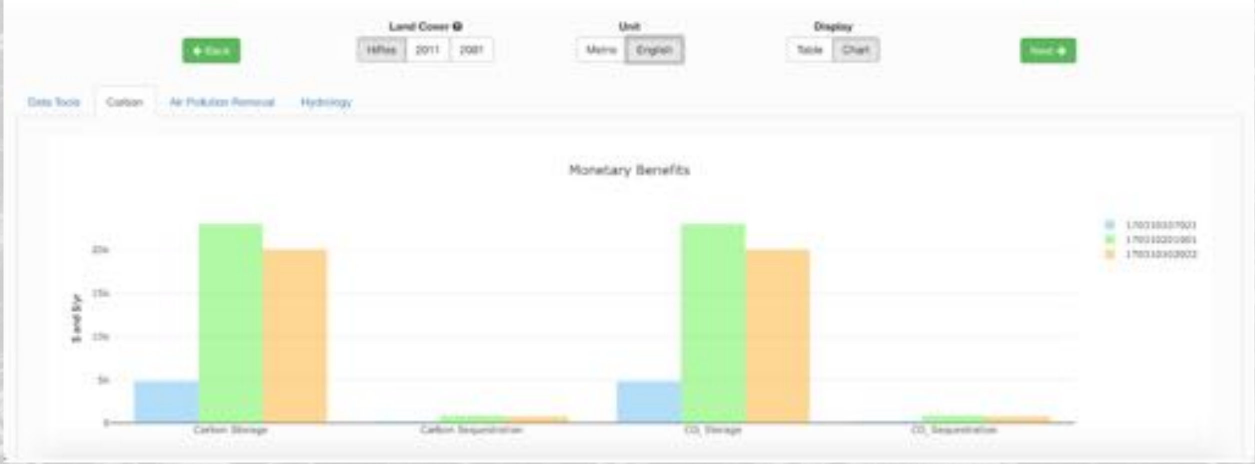
i-Tree Landscape gives you the opportunity to see the tree benefits associated with your desired project location. This manual describes the different features of iTree Landscape, the benefits associated with tree cover in your selected location, and how iTree Landscape shows you that data. Potential next steps are to **Prioritize Tree Planting, Other Map Layers, or Generate Results Report.**

SEE TREE BENEFITS

1. Data are displayed underneath the map and you can choose whether you would like your dataset to be viewed in English or Metric units and in table or chart form. In the chart form you have the option of saving a png. version of your tree benefits. You can also choose the dataset that you would like your location data to be based on by clicking one of the following buttons:

- "HiRes"– data are based on high resolution land cover data, however depending on your location this data may or may not be available.
- "2011" – data are based on the 2011 National Land Cover Database.
- "2001" – data are based on the 2001 National Land Cover Database.

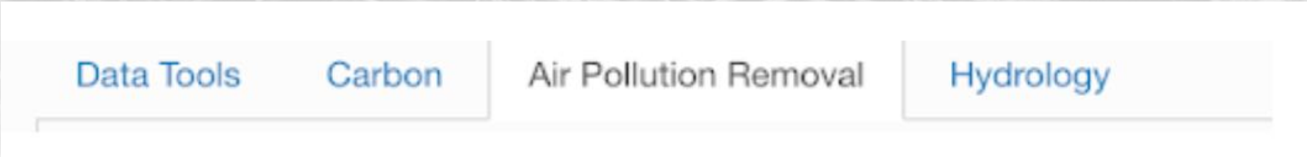

i-Tree Landscape
Home
Project
Menu
i-Tree
Feedback
Find Locations
Explore Location Data
See Tree Benefits
Prioritize Tree Planting
Generate Reports
Land Cover
HiRes
2011
2001
Unit
Metric
English
Display
Table
Chart
Back
Next
Data Tools
Carbon
Air Pollution Removal
Hydrology
Carbon Storage
Carbon Sequestration
CO₂ Equivalent Storage
CO₂ Equivalent Sequestration
Remove
Dataset
Type
Name
ID
Swap
Highlight
Short Ton
$/yr
t/yr
Selection Total:


Land Cover
HiRes
2011
2001
Unit
Metric
English
Display
Table
Chart
Back
Next
Data Tools
Carbon
Air Pollution Removal
Hydrology
Monetary Benefits
$ and $/yr
20k
15k
10k
5k
0
Carbon Storage
Carbon Sequestration
CO₂ Storage
CO₂ Sequestration

SEE TREE BENEFITS

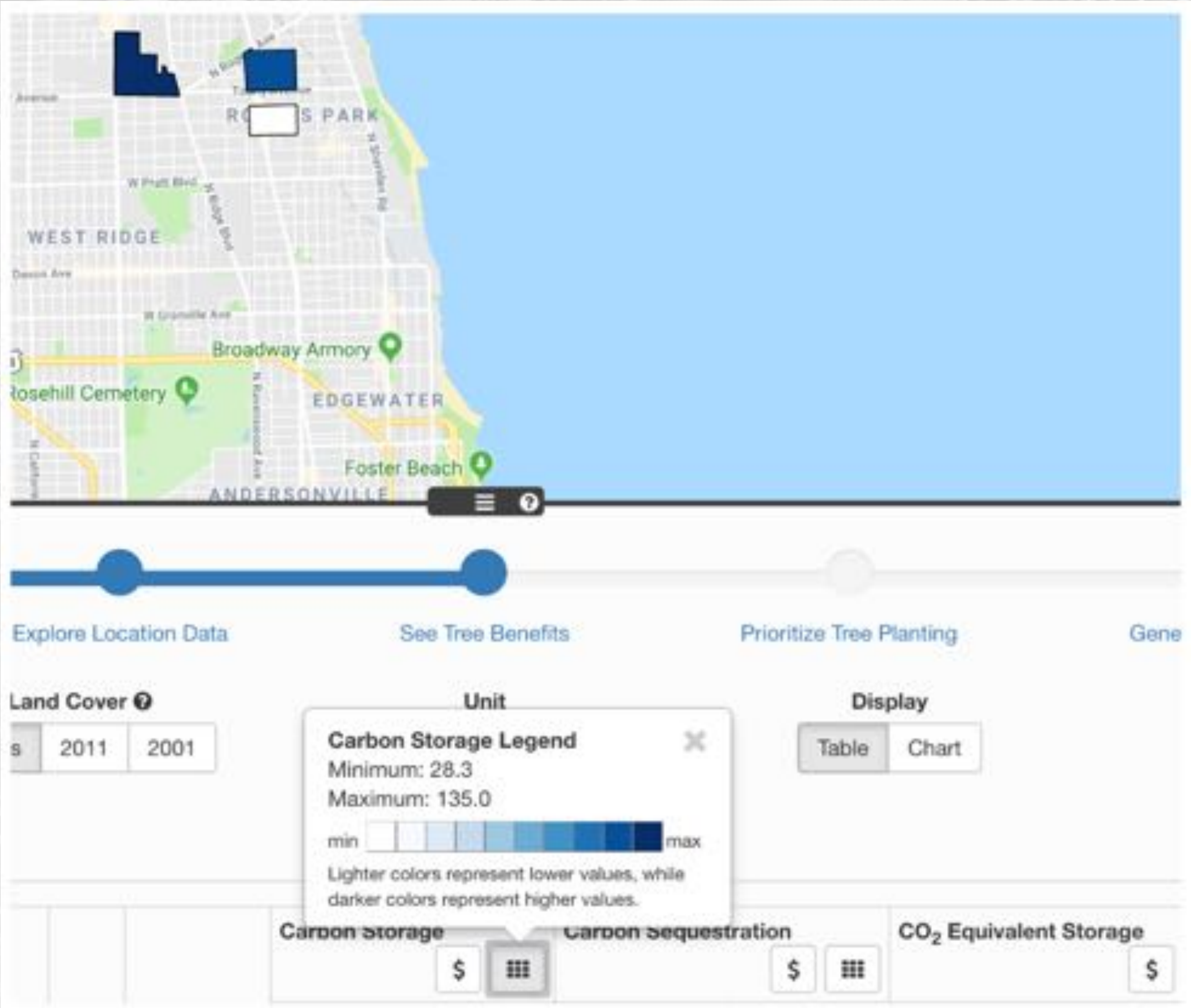
2. The data below the map is divided into the following tabs which you can click on to see in either table or chart form as well:

- Carbon - The ‘Carbon’ tab includes carbon and carbon dioxide equivalent that is sequestered and stored by the trees your project’s location. Carbon sequestration refers to the removal of carbon dioxide from the atmosphere. Carbon storage refers to the amount of carbon bound up in woody material above and below ground. The associated monetary value of carbon storage and sequestration is also displayed.
- Air Pollution - The ‘Air Pollution’ tab includes the amount and monetary value of the air pollution that is removed by the trees in each selected region.
- Hydrology - The ‘Hydrology’ tab shows how the trees in your project’s location affect the local hydrology. This section’s results include transpiration, rainfall interception, and avoided runoff estimates.



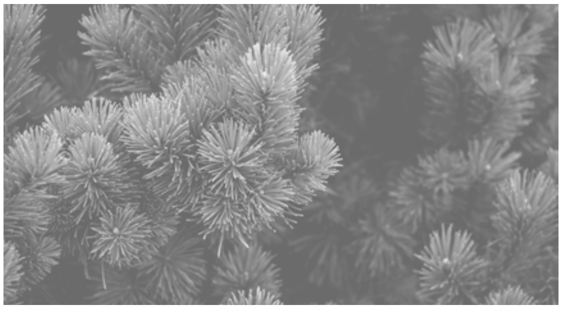
SEE TREE BENEFITS

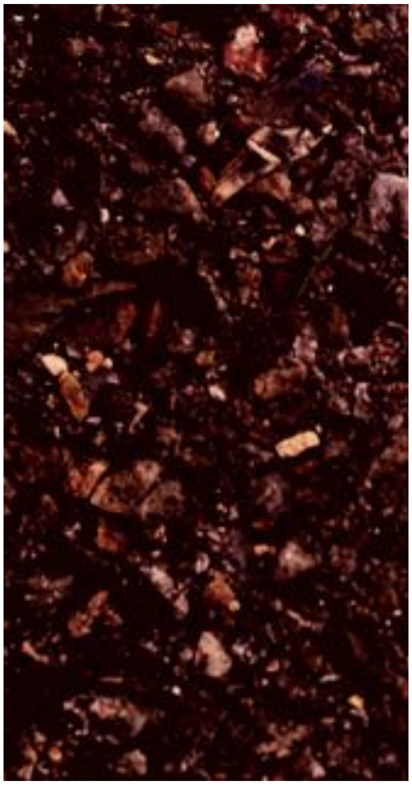
3. For each category there are option to view color-coded legends showing you ‘Min’ to ‘Max’ from light to dark respectively.


ROGERS PARK
WEST RIDGE
W Pratt Blvd
N Ridge Blvd
N Sheridan Rd
Devon Ave
W Granville Ave
Broadway Armory
Rosehill Cemetery
N Ravenswood Ave
EDGEWATER
Foster Beach
ANDERSONVILLE
N California
Explore Location Data
See Tree Benefits
Prioritize Tree Planting
Gene
Land Cover
2011
2001
Unit
Display
Table
Chart
Carbon Storage
Carbon Sequestration
CO₂ Equivalent Storage
$
$
$
min
max

Carbon Storage Legend
Minimum: 28.3
Maximum: 135.0

Lighter colors represent lower values, while darker colors represent higher values.





PRIORITIZE TREE PLANTING

i-Tree Landscape has the ability to prioritize areas for tree planting based on census data (i.e. poverty, population, percentage minorities) and existing land use data (i.e. canopy area, plantable space) to create tree planting priority maps.

It is important to note that using the priority planting index requires multiple regions. If your project area does not contain at least two regions, this stage will not be able to operate.

PRIORITIZE TREE PLANTING

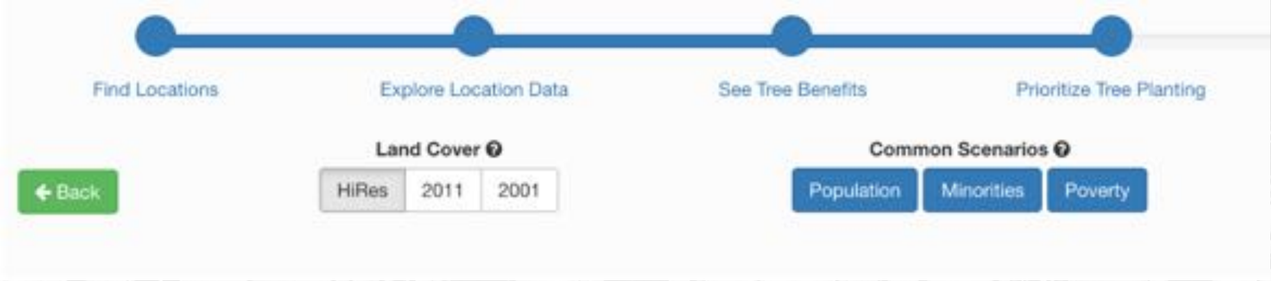
PLANTING SCENARIO OPTIONS

1. Start by indicating which of the land cover datasets you would like for your priority planting scenario this is the data your location will be based on:

- "HiRes" – data are based on high resolution land cover data, however depending on your location this data may or may not be available.
- "2011" – data are based on the 2011 National Land Cover Database.
- "2001" – data are based on the 2001 National Land Cover Database.

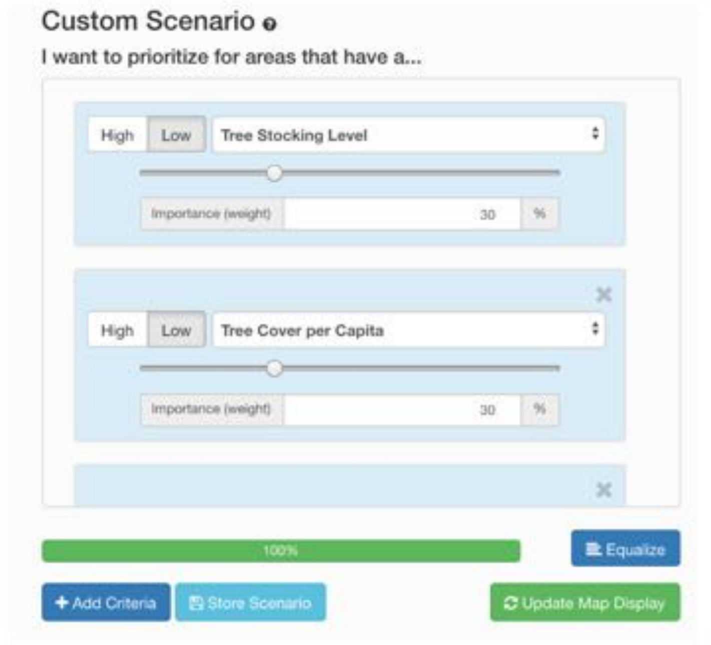
2. i-Tree Landscape already provides common scenarios such as population, minorities, or poverty. Depending on your project area the common scenarios that can be changed, prioritized, and combined to best meet your project area's needs. Below is how each of the common scenarios are weighted on i-Tree Landscape:

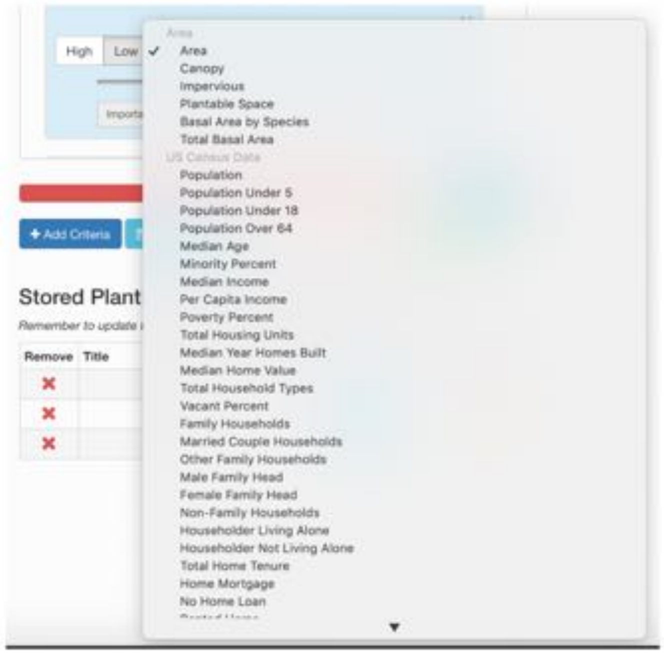
- Population: (default) an index weighted towards areas of relatively high population density, low tree cover per capita, and high available planting space.
- Minorities: an index weighted towards areas of relatively high minority population density, low tree cover per capita, and high available planting space.
- Poverty: an index weighted towards areas of relatively high proportion of population below the poverty line, low tree cover per capita, and high available planting space. (i-Tree Landscape)


Find Locations
Explore Location Data
See Tree Benefits
Prioritize Tree Planting
Land Cover
Common Scenarios
Back
HiRes
2011
2001
Population
Minorities
Poverty

PRIORITIZE TREE PLANTING

3. Beyond these common scenarios i-Tree Landscape also gives you the opportunity to create custom scenarios that you to best address your project area's concern(s). Choose to create your own custom priority planting scenarios by defining the criteria and weights in the boxes provided. Inside the Custom Scenario area there will be various light blue colored boxes. Each of these boxes contain a different factor that can be prioritized in your scenario. By clicking Add Criteria you can add more attributes of your choosing by clicking their drop down menu and selecting the attributes of your choice.


Custom Scenario
I want to prioritize for areas that have a...
High
Low
Tree Stocking Level
Importance (weight)
30
%
High
Low
Tree Cover per Capita
Importance (weight)
30
%
100%
Equalize
+ Add Criteria
Store Scenario
Update Map Display

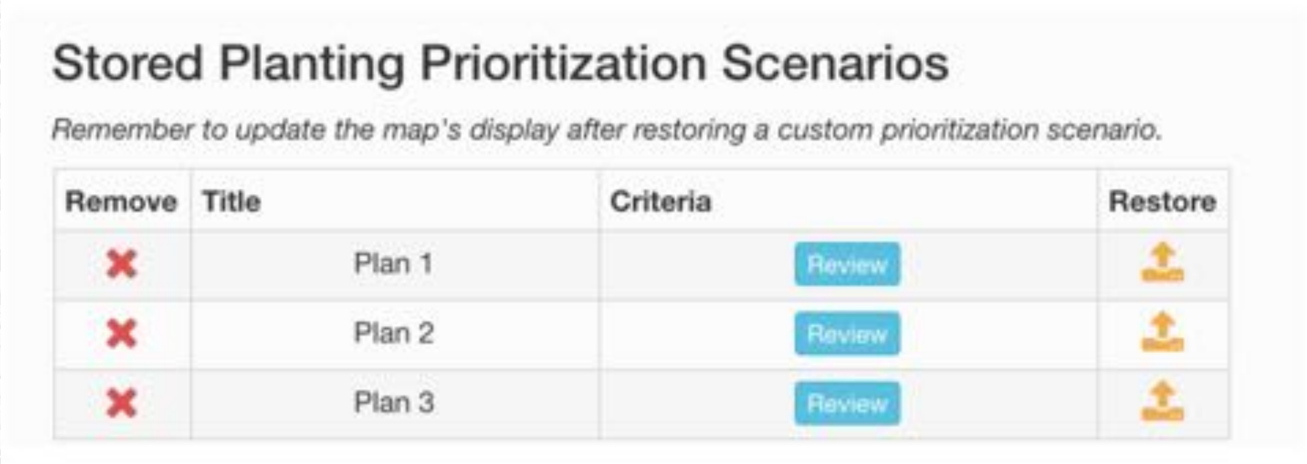

High
Low
Area
✓ Area
Canopy
Impervious
Plantable Space
Basal Area by Species
Total Basal Area
US Census Data
Population
Population Under 5
Population Under 18
Population Over 64
Median Age
Minority Percent
Median Income
Per Capita Income
Poverty Percent
Total Housing Units
Median Year Homes Built
Median Home Value
Total Household Types
Vacant Percent
Family Households
Married Couple Households
Other Family Households
Male Family Head
Female Family Head
Non-Family Households
Householder Living Alone
Householder Not Living Alone
Total Home Tenure
Home Mortgage
No Home Loan
+ Add Criteria
Stored Plant
Remember to update
Remove
Title

4. The custom scenario is weighted from 0 to 100. The sum of all the weights of each of your attributes must equal 100. In each light blue box you can set the importance/ weight of that attribute or if you want the weights to be equal click the Equalize button at the bottom of your attributes list.

PRIORITIZE TREE PLANTING

5. Click **Update Map Display** to see the results on map and on the **Current Prioritization Scenario Legend** (See more on legend below)

6. Each Custom Scenario can be saved by clicking **Store Scenario.** These saved scenarios can be included in your report when you **Generate Results.**



Stored Planting Prioritization Scenarios

Remember to update the map's display after restoring a custom prioritization scenario.

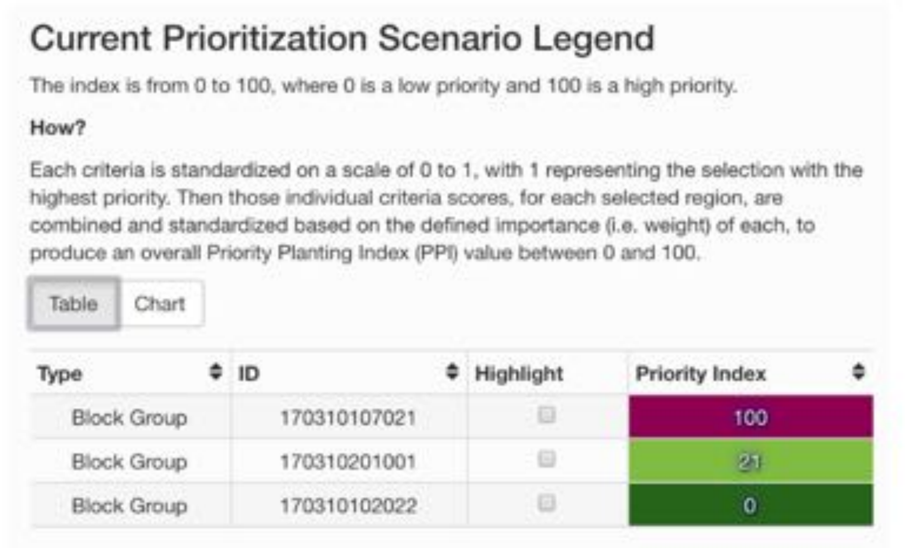
Remove	Title	Criteria	Restore
✖	Plan 1	Review	⇧
✖	Plan 2	Review	⇧
✖	Plan 3	Review	⇧

PRIORITIZE TREE PLANTING

CURRENT PRIORITIZATION SCENARIO LEGEND

Each time you **Update Map Display** your custom scenario will change this legend along with the map above. This legend shows you how your current custom scenario impacts each of your block groups. This is helpful in helping you indicate if your scenario is affecting your areas of highest priority. The index is from 0 to 100, 0 representing a low priority and 100 representing a high priority.

Some high priority areas may be located on private or already developed properties. Ground truthing will allow practitioners to determine the feasibility of planting in high priority areas or allow them to use these i-Tree Landscape materials to start conversations about tree planting with private property owners.



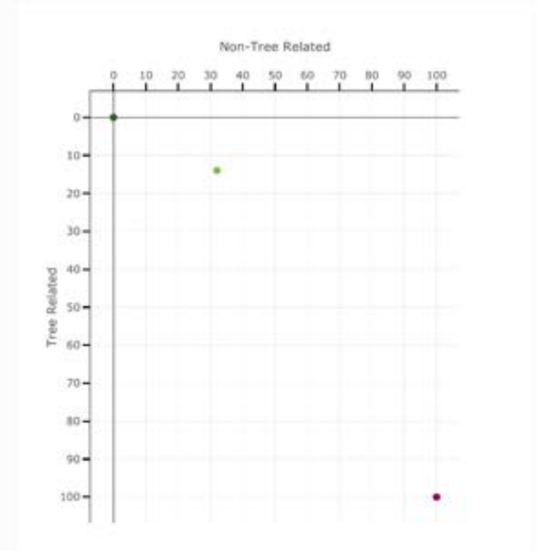
Current Prioritization Scenario Legend

The index is from 0 to 100, where 0 is a low priority and 100 is a high priority.

How?

Each criteria is standardized on a scale of 0 to 1, with 1 representing the selection with the highest priority. Then those individual criteria scores, for each selected region, are combined and standardized based on the defined importance (i.e. weight) of each, to produce an overall Priority Planting Index (PPI) value between 0 and 100.

Type	ID	Highlight	Priority Index
Block Group	170310107021	☐	100
Block Group	170310201001	☐	21
Block Group	170310102022	☐	0



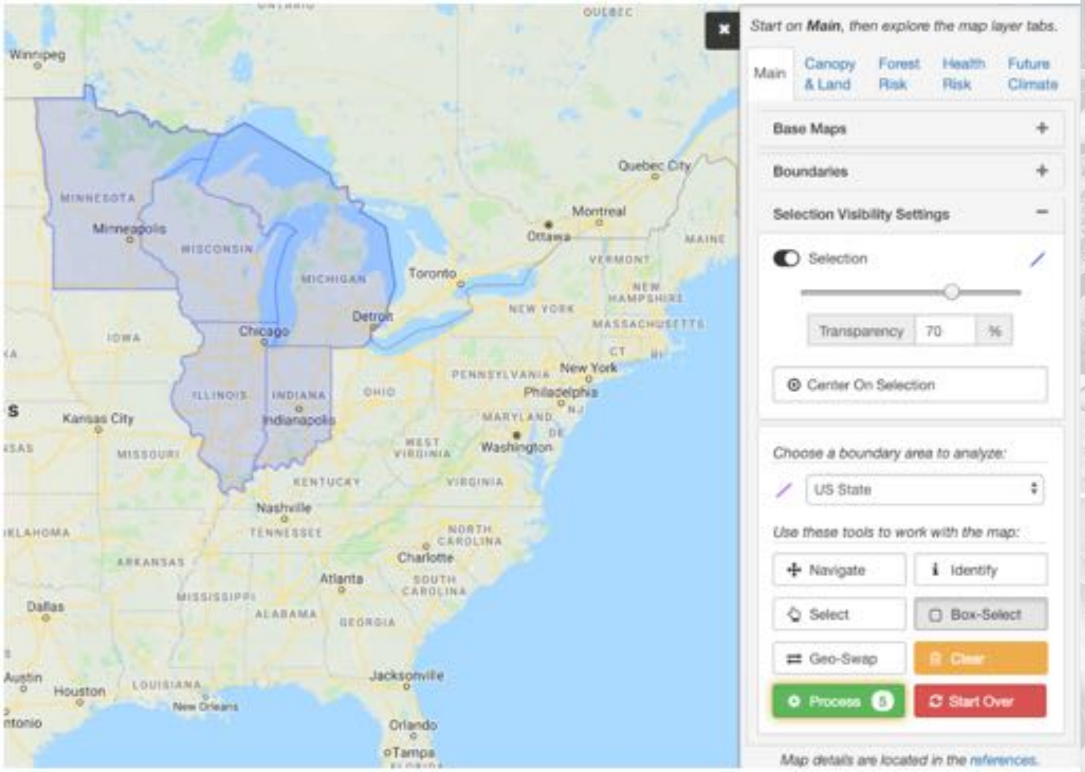
OTHER MAP LAYERS

Beyond the Main base map layer there are several other map layers that will aid in your project. i-Tree Landscapes other map layers are **Canopy and Land, Forest Risk, Health Risk, & Future Climate.** These map layers give insight into how your location is affected by current risks and how your location will be impacted due to climate change/future climate. These insights are crucial in the planning for future tree planting in your project area. The following paragraphs will break down what information each map layer provides and how to use each map layer.

OTHER MAP LAYERS

Our map is going to show the following map layers on 5 midwestern states: Minnesota, Wisconsin, Illinois, Indiana, and Michigan. This is just to show you more variability in color differentiations to fully show you the possibilities i-Tree offers in each map layer. Each color may not pop up as distinctly in your project area if it is a smaller specific area. For instructions on how to Select Your Location, see the manual titled **Select Your Location.**

We selected these 5 states using the “US State” boundary area selection option in the **Main** map layer tab.


Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Base Maps
Boundaries
Selection Visibility Settings
Selection
Center On Selection
Navigate
Identify
Select
Box-Select
Geo-Swap
Clear
Process 5
Start Over
Winnipeg
MINNESOTA
Minneapolis
WISCONSIN
MICHIGAN
Chicago
Detroit
IOWA
ILLINOIS
INDIANA
Indianapolis
OHIO
Kansas City
MISSOURI
KENTUCKY
Nashville
TENNESSEE
OKLAHOMA
ARKANSAS
MISSISSIPPI
ALABAMA
GEORGIA
Atlanta
Dallas
Austin
Houston
LOUISIANA
New Orleans
Jacksonville
Orlando
Tampa
Toronto
Ottawa
Montreal
Quebec City
QUEBEC
MAINE
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
CT
NEW YORK
New York
PENNSYLVANIA
Philadelphia
NJ
MARYLAND
DE
Washington
WEST VIRGINIA
VIRGINIA
NORTH CAROLINA
Charlotte
SOUTH CAROLINA

*Start on **Main**, then explore the map layer tabs.*

Transparency 70 %

Choose a boundary area to analyze:

US State

Use these tools to work with the map:

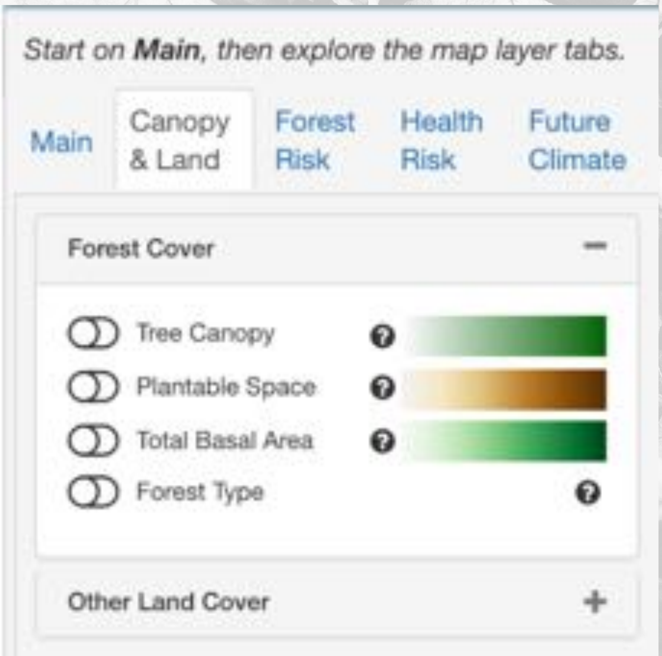
Map details are located in the references.

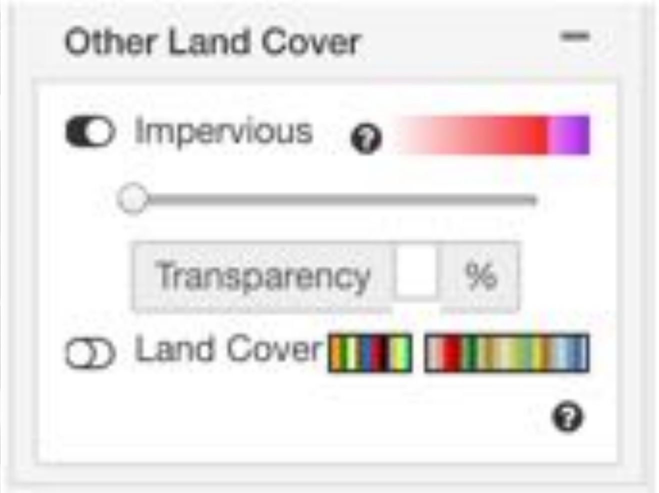
We have also lowered the transparency of the 5 states through the use of the **Selection Visibility Settings** in the **Main** map layer tab to increase your view-ability in the guided images. Our transparency is set to 70%

OTHER MAP LAYERS

CANOPY AND LAND

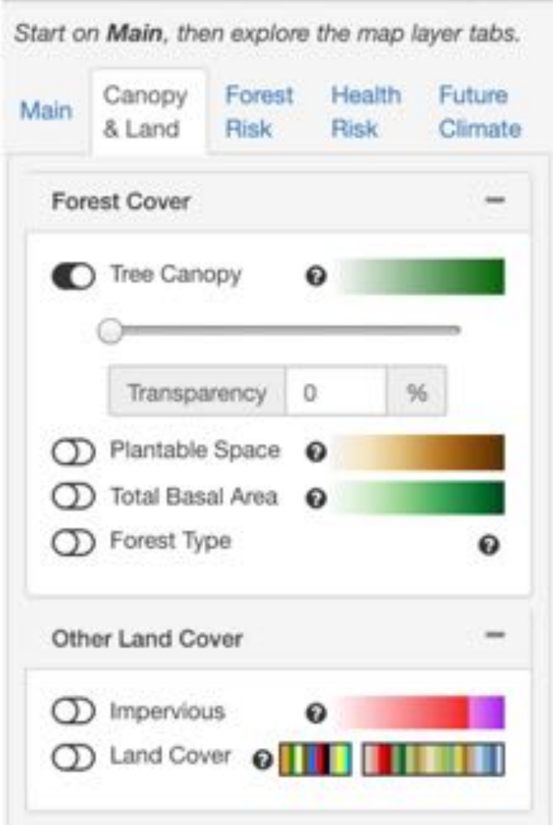
In the **Canopy & Land** map layer tab, you have the tools to be able to see what your project area looks like currently in terms of **Forest Cover** and **Other Land Cover. Forest Cover** lets you look at **Tree Canopy, Plantable Space, Total Basal Area** (area occupied by tree trunks or stems), and **Forest Type. Other Land Cover** shows you **Impervious** surfaces and other types of **Land Cover** in your project area. (See other types of **Land Cover** below.) This step is important in choosing your project area and also learning more about how your project area's overall landscape. This knowledge can aid you in future planning of tree planting or species selection for your project area.


Start on **Main**, then explore the map layer tabs.
Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Forest Cover
Tree Canopy
Plantable Space
Total Basal Area
Forest Type
Other Land Cover


Other Land Cover
Impervious
Transparency
%
Land Cover

OTHER MAP LAYERS

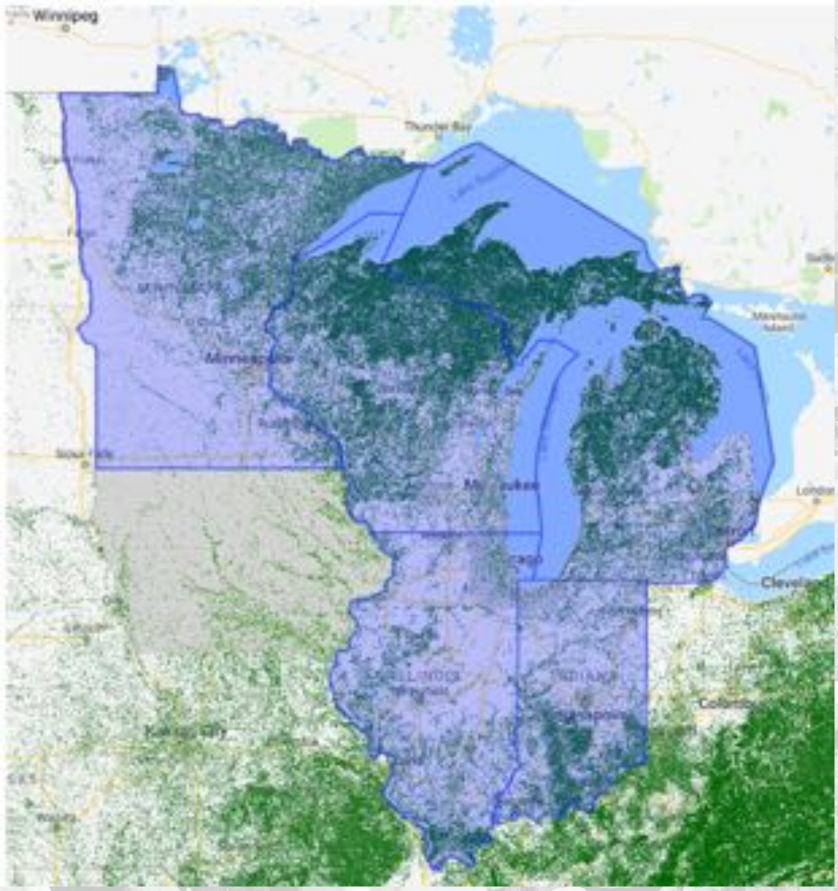
The following images show the various options to view in the **Canopy & Land** map layer are displayed on i-Tree Landscape.



*Start on **Main**, then explore the map layer tabs.*

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Forest Cover
Tree Canopy
Plantable Space
Total Basal Area
Forest Type
Other Land Cover
Impervious
Land Cover

Transparency 0 %



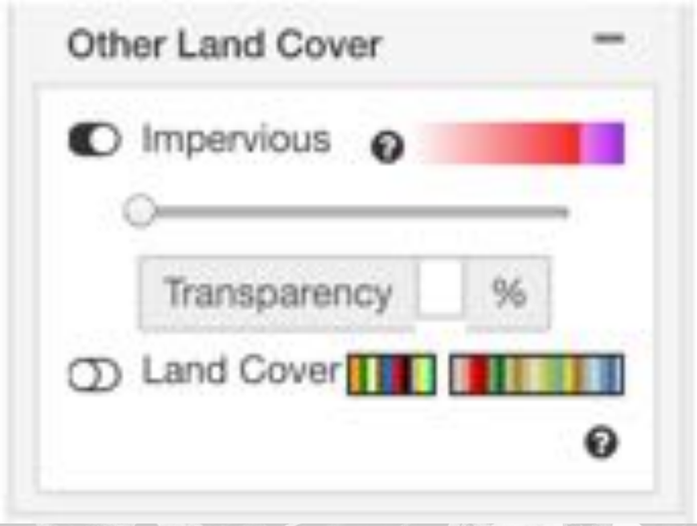
Winnipeg
Thunder Bay
Minneapolis
Milwaukee
Cleveland

Other **Forest Cover** options in the **Canopy & Land** map layer to explore are:

- Plantable Space
- Total Basal Area (area occupied by tree trunks or stems)
- Forest Type

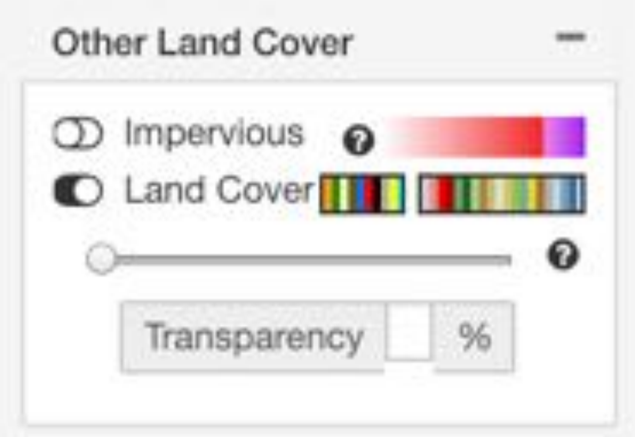
OTHER MAP LAYERS

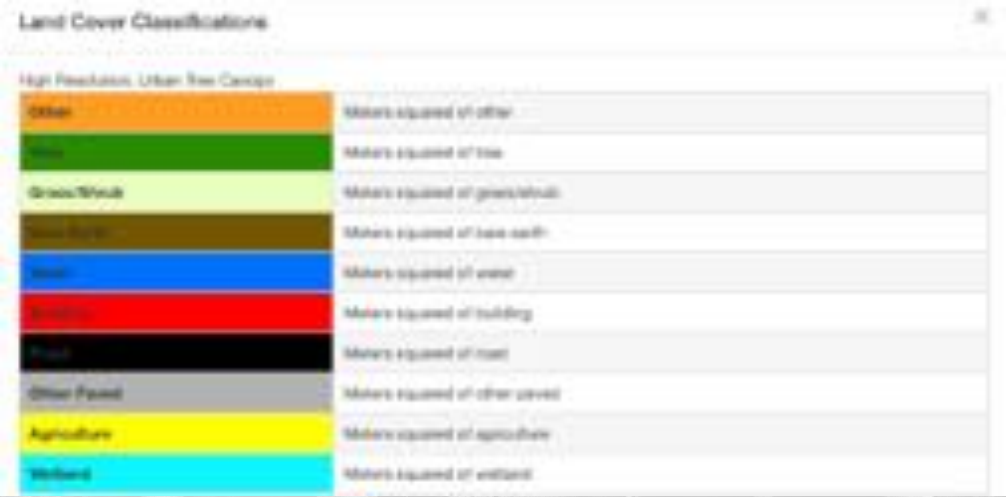
Other Land Cover within the **Canopy & Land** map layer, gives you the opportunity to explore different features in your project area. This option offers two different features: **Impervious** or **Land Cover.**


Other Land Cover
Impervious
Transparency
%
Land Cover

OTHER MAP LAYERS

Land Cover features a wide variety of land cover to explore within your project area (See below for images all **Land Cover** options.)



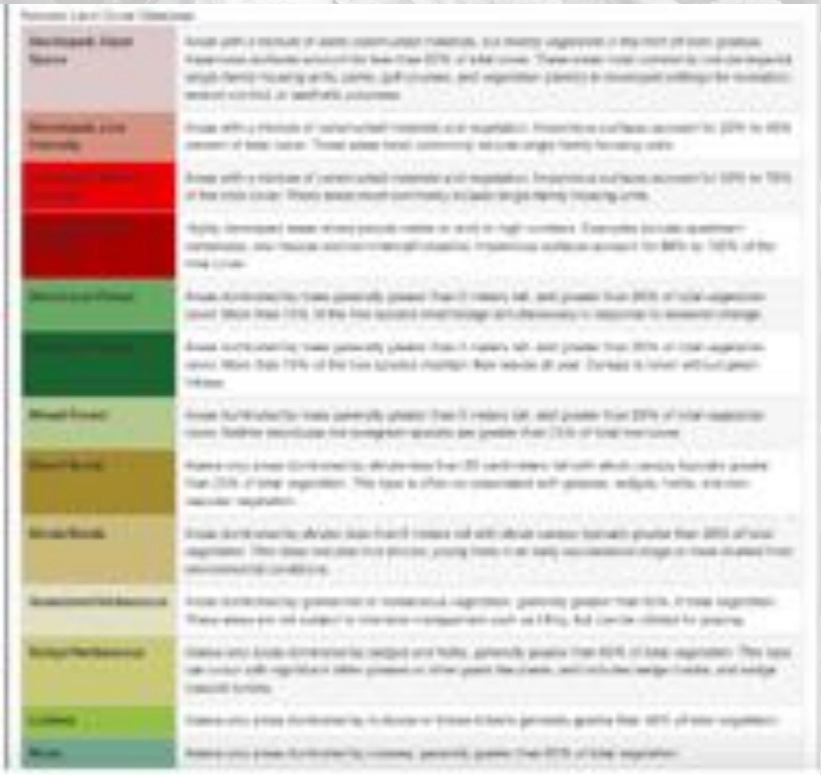


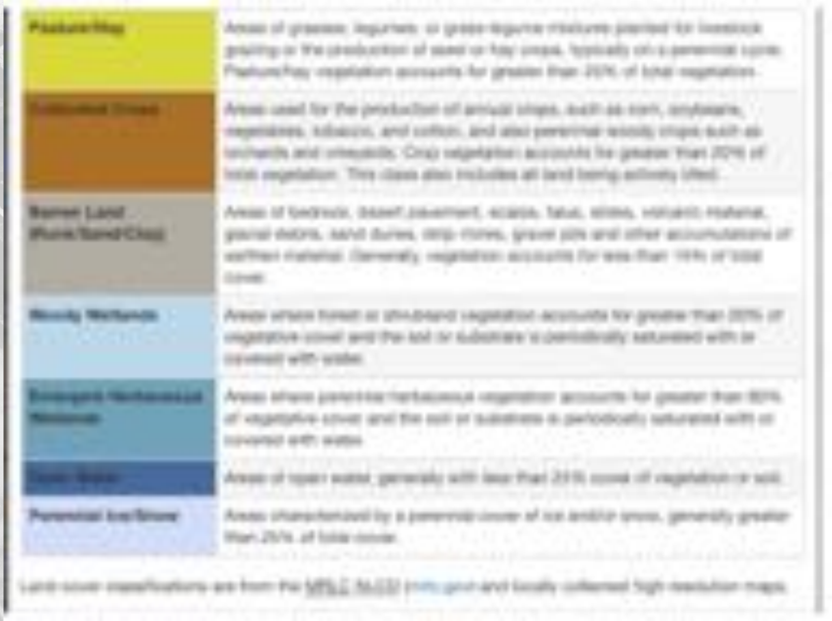
Land Cover Classifications

High Resolution, Urban Tree Canopy

Other	Meters squared of other
Tree	Meters squared of tree
Grass/Shrub	Meters squared of grass/shrub
Bare Earth	Meters squared of bare earth
Water	Meters squared of water
Building	Meters squared of building
Road	Meters squared of road
Other Paved	Meters squared of other paved
Agriculture	Meters squared of agriculture
Wetland	Meters squared of wetland

OTHER MAP LAYERS

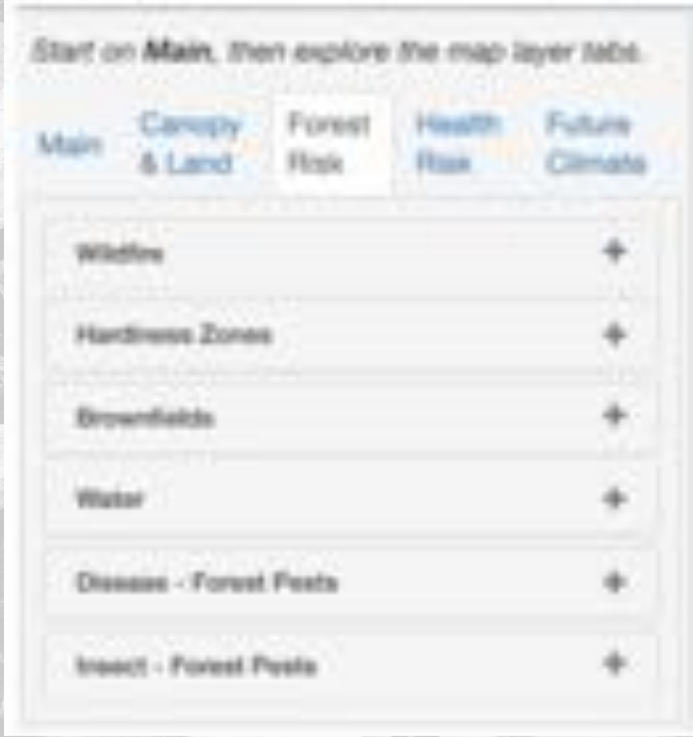




OTHER MAP LAYERS

FOREST RISK

In the **Forest Risk** map layer tab, you have the tools to identify potential risks in your project area and around it. **Forest Risk** contains information regarding **Wildfire potential, Hardiness Zones, Brownfields, Water risk, Disease- Forest Pest,** and **Insect- Forest Pest.** The information provided in this map layer may give you insight into prevention plans your project may need, or the types of tree species you should be planting.

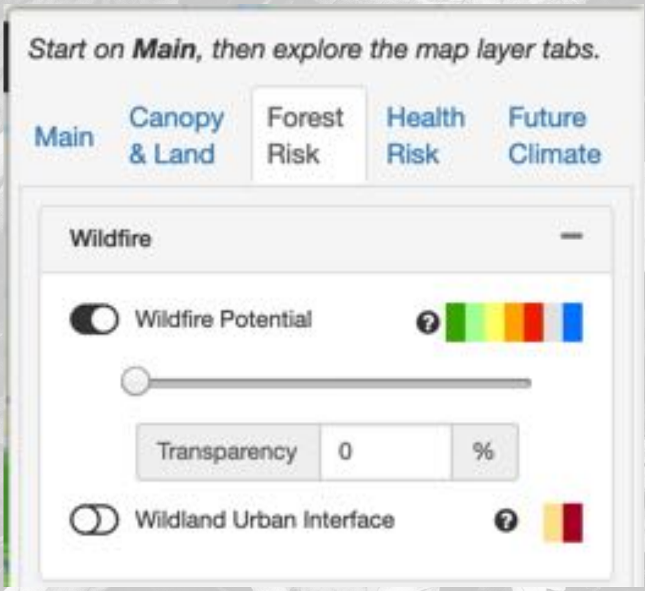


Start on **Main**, then explore the map layer tabs.

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Wildfire +
Hardiness Zones +
Brownfields +
Water +
Disease - Forest Pests +
Insect - Forest Pests +

OTHER MAP LAYERS

The following images show the various options to view in the **Forest Risk** map layer are displayed on i-Tree Landscape.


Main
Canopy & Land
Forest Risk
Health Risk
Future Climate

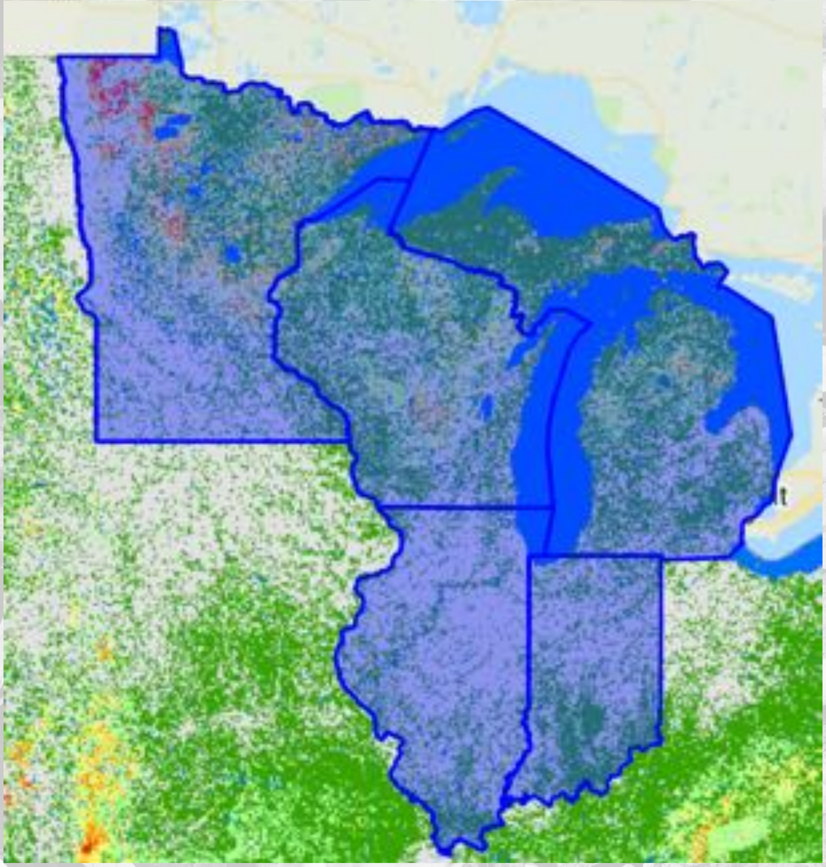
*Start on **Main**, then explore the map layer tabs.*

Wildfire

● Wildfire Potential

Transparency 0 %

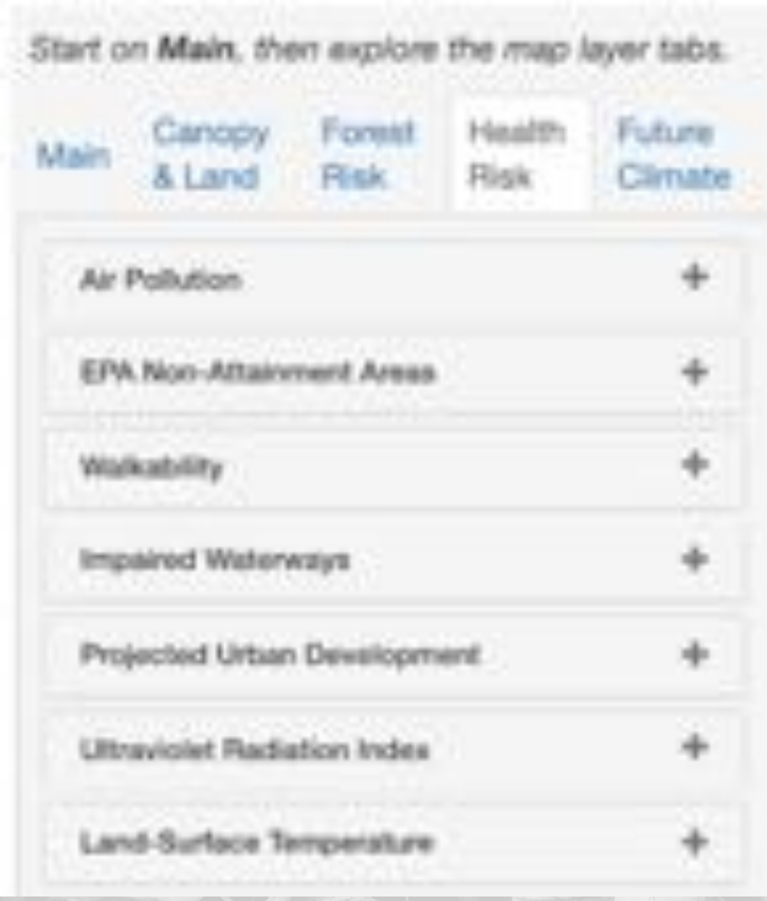
○ Wildland Urban Interface



OTHER MAP LAYERS

HEALTH RISK

In the **Health Risk** map layer tab, you have the tools to identify areas that are a risk to human health currently. This tab is useful if you are interested in tree planting for human health benefits. **Health Risk** contains information regarding **Air Quality, EPA Non-Attainment Areas** (these are areas the EPA considered to have air quality worse than the National Ambient Air Quality Standards as defined in the Clean Air Act Amendments of 1970 (P.L. 91-604, Sec. 109)), **Walkability** (this is based on sidewalk availability in the area), **Impaired Waterways, Projected Urban Development, Ultraviolet Radiation Index** (UV rays), and **Land Surface Temperature.**

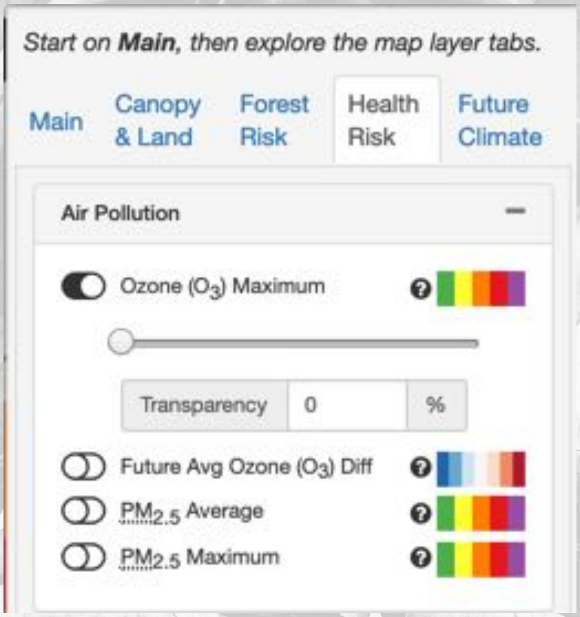


Start on **Main**, then explore the map layer tabs.

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Air Pollution +
EPA Non-Attainment Areas +
Walkability +
Impaired Waterways +
Projected Urban Development +
Ultraviolet Radiation Index +
Land-Surface Temperature +

OTHER MAP LAYERS

The following images show various options that can be displayed in the **Health Risk** map layer.


Start on **Main**, then explore the map layer tabs.

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Air Pollution
−

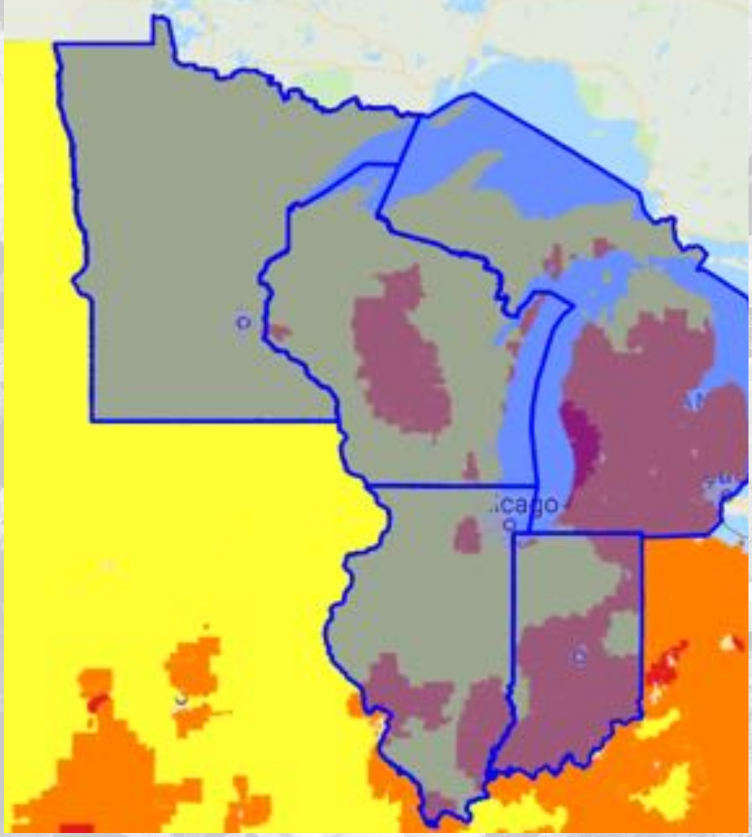
● Ozone (O_3) Maximum

Transparency 0 %

○ Future Avg Ozone (O_3) Diff

○ $PM_{2.5}$ Average

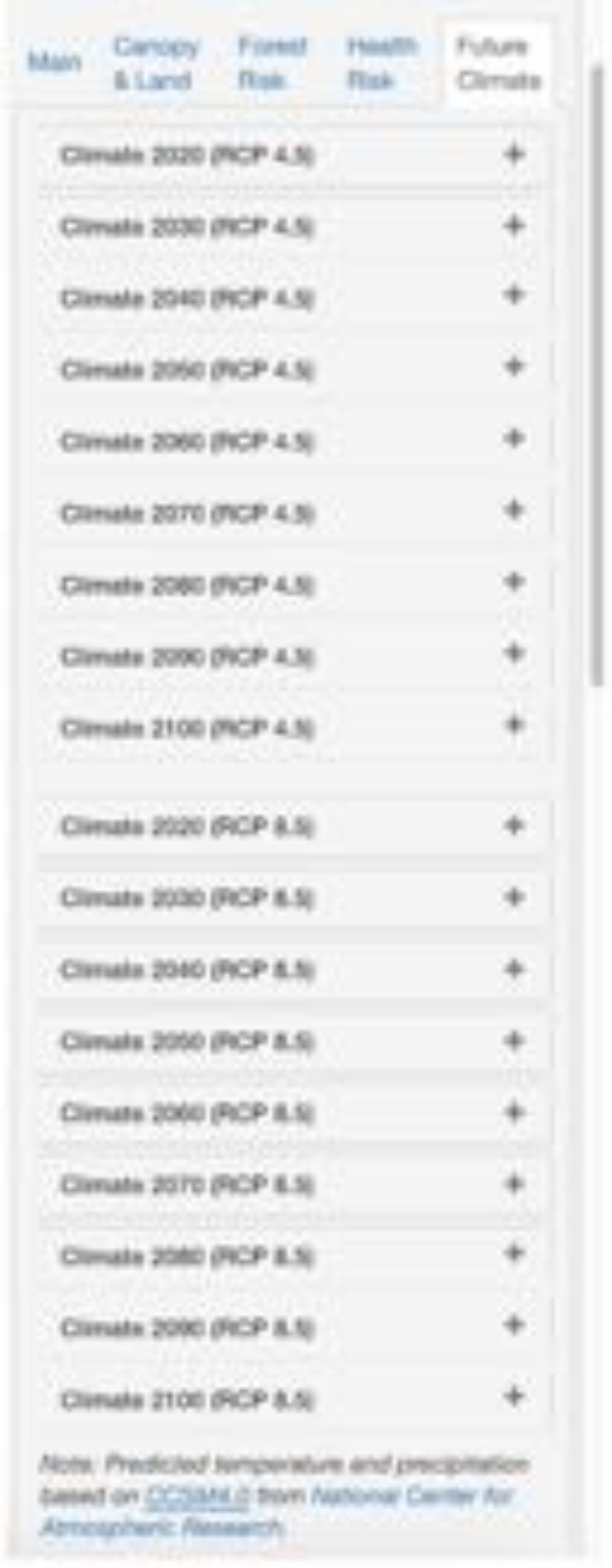
○ $PM_{2.5}$ Maximum



OTHER MAP LAYERS

FUTURE CLIMATE

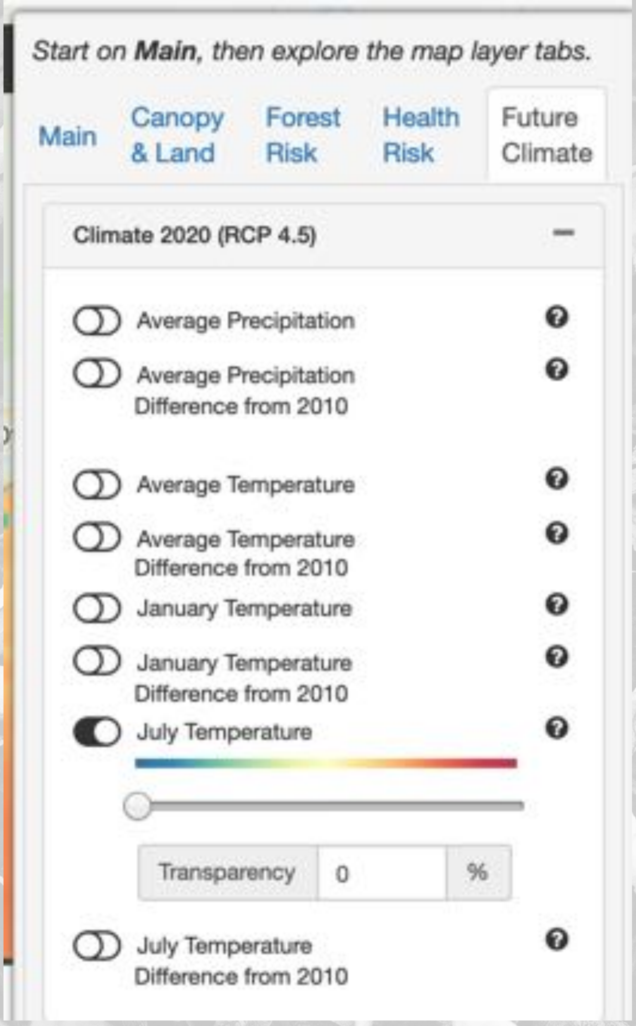
In the **Future Climate** map layer tab, you have the tools to view your project area's changing future climate. Projections of future climate are available from year 2020 to year 2100. This tab is important in the planning of your project in order to see what types of tree species would do well in future climate conditions. This tab facilitates planning for future generations to come.


Main
Canopy & Land
Forest Risk
Health Risk
Future Climate
Climate 2020 (RCP 4.5) +
Climate 2030 (RCP 4.5) +
Climate 2040 (RCP 4.5) +
Climate 2050 (RCP 4.5) +
Climate 2060 (RCP 4.5) +
Climate 2070 (RCP 4.5) +
Climate 2080 (RCP 4.5) +
Climate 2090 (RCP 4.5) +
Climate 2100 (RCP 4.5) +
Climate 2020 (RCP 8.5) +
Climate 2030 (RCP 8.5) +
Climate 2040 (RCP 8.5) +
Climate 2050 (RCP 8.5) +
Climate 2060 (RCP 8.5) +
Climate 2070 (RCP 8.5) +
Climate 2080 (RCP 8.5) +
Climate 2090 (RCP 8.5) +
Climate 2100 (RCP 8.5) +

Note: Predicted temperature and precipitation based on CCSM4.0 from National Center for Atmospheric Research.

OTHER MAP LAYERS

The following images show various options that can be displayed in the **Future Climate** map layer.



*Start on **Main**, then explore the map layer tabs.*

Main
Canopy & Land
Forest Risk
Health Risk
Future Climate

Climate 2020 (RCP 4.5) —

○ Average Precipitation

○ Average Precipitation Difference from 2010

○ Average Temperature

○ Average Temperature Difference from 2010

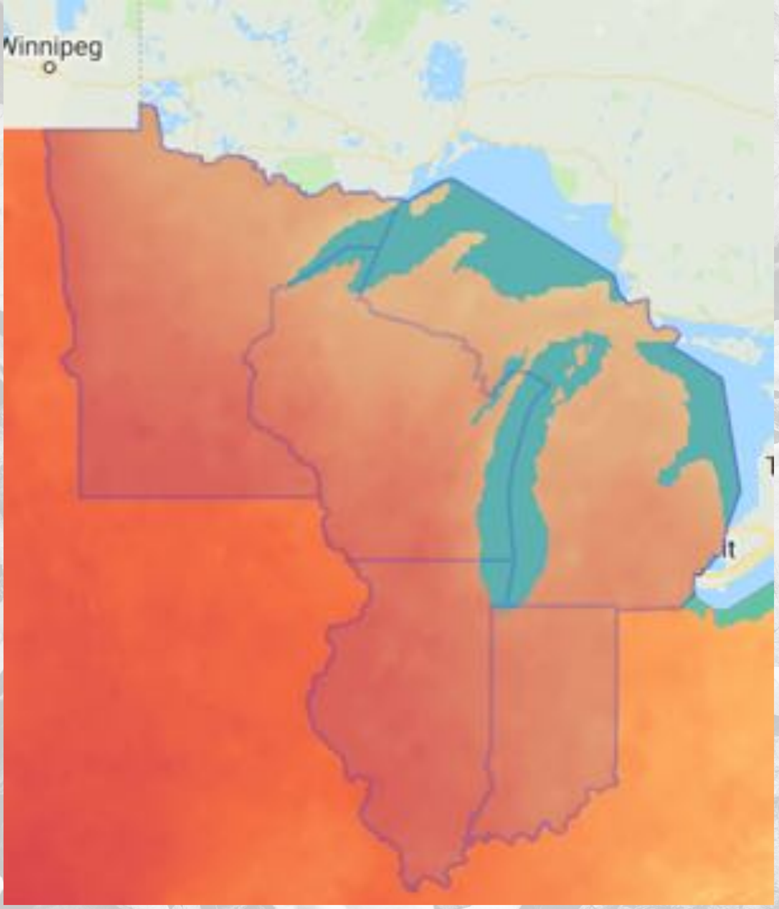
○ January Temperature

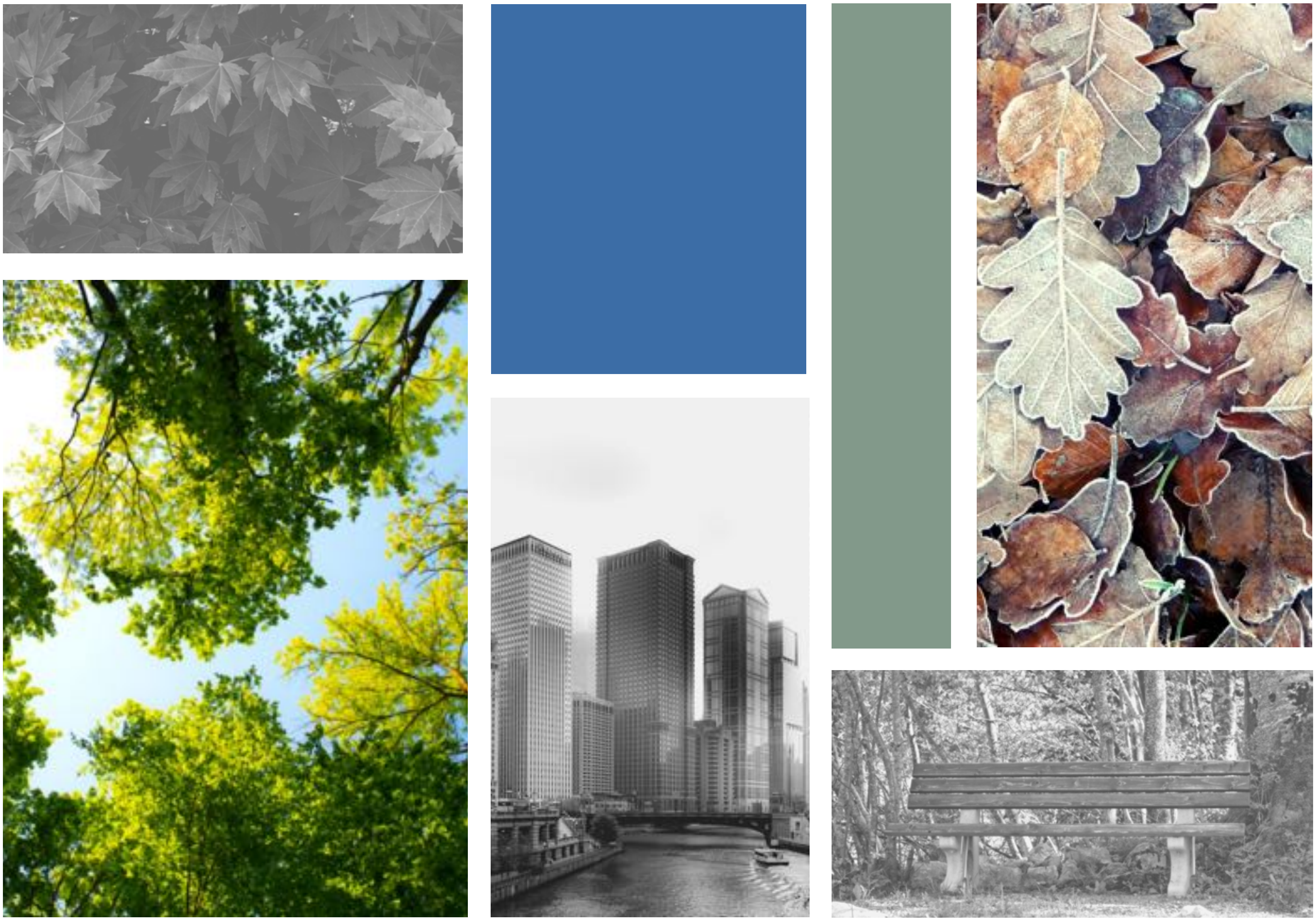
○ January Temperature Difference from 2010

● July Temperature

Transparency 0 %

○ July Temperature Difference from 2010



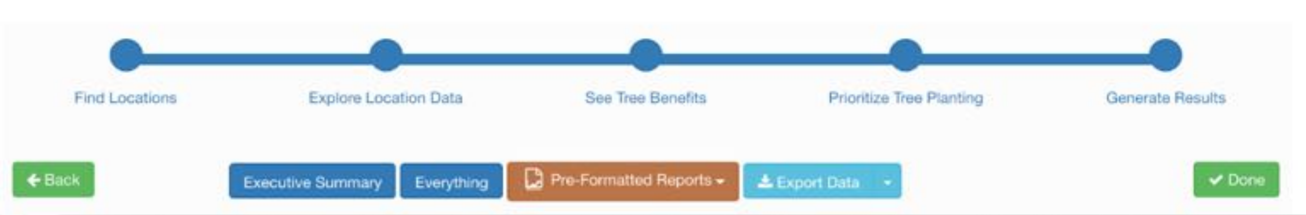


GENERATE RESULTS

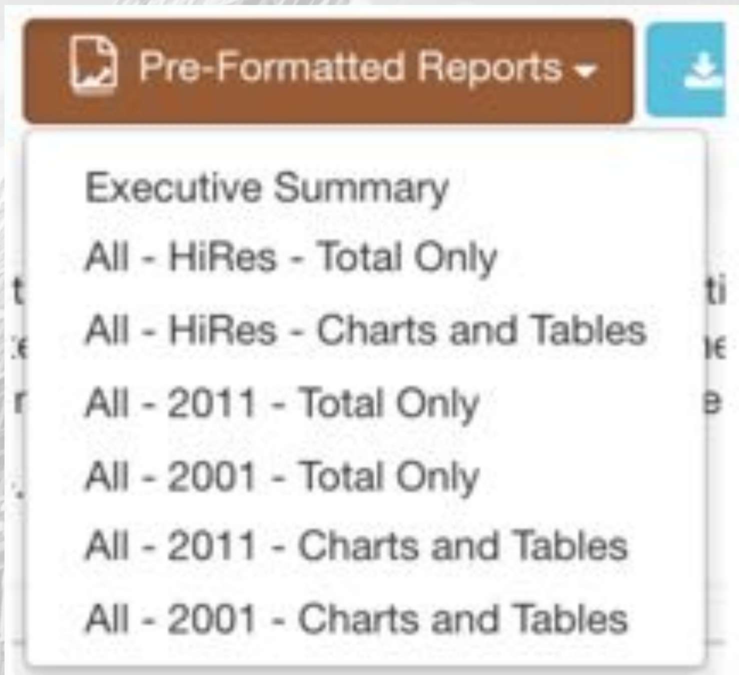
You are near the completion of your project! You are now at the point where you can create, view, and export reports containing your results. i-Tree Landscape provides several standard reports or you can create your own custom reports.

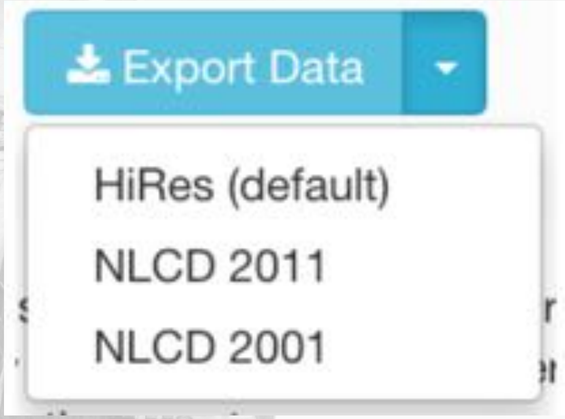
GENERATE RESULTS

To move back to a different step, click the Back button or click on the desired step in the progress bar.


Find Locations
Explore Location Data
See Tree Benefits
Prioritize Tree Planting
Generate Results
Back
Executive Summary
Everything
Pre-Formatted Reports
Export Data
Done

In these top buttons you have the **Pre-Formatted Reports** button that gives you various kinds of standard reports to click and use. There is also the **Export Data** button that allows you to export the database your location data is based off of.

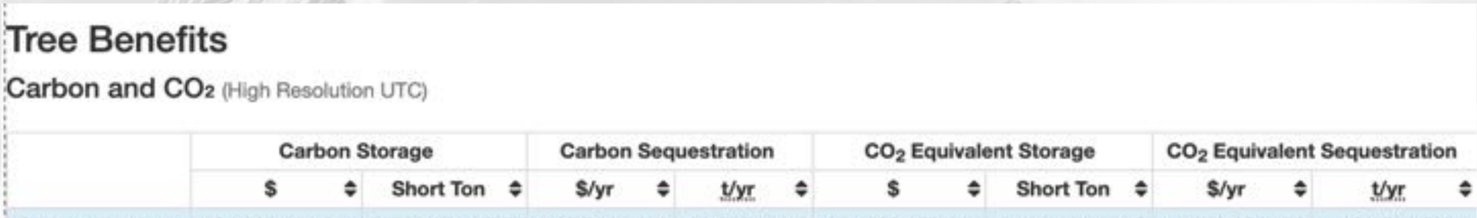

Pre-Formatted Reports
Executive Summary
All - HiRes - Total Only
All - HiRes - Charts and Tables
All - 2011 - Total Only
All - 2001 - Total Only
All - 2011 - Charts and Tables
All - 2001 - Charts and Tables


Export Data
HiRes (default)
NLCD 2011
NLCD 2001

GENERATE RESULTS

In generating a custom report there are several boxes going along with each previous step you have conducted during your project such as: Location Information, Tree Benefits, and Prioritization. Within each box, the following features are available:

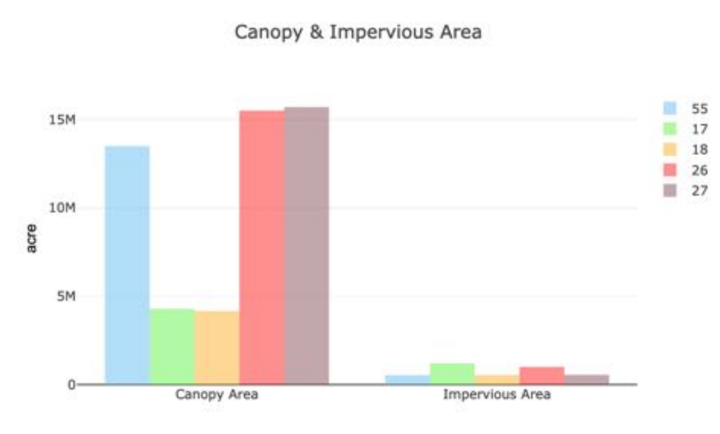
- Report Element – Choose the data that you would like to include in your project's report by selecting from the drop-down menu.
- Display As – Choose how you would like to view your report element in "Table," "Chart," or "Map" by selecting from the drop-down menu.

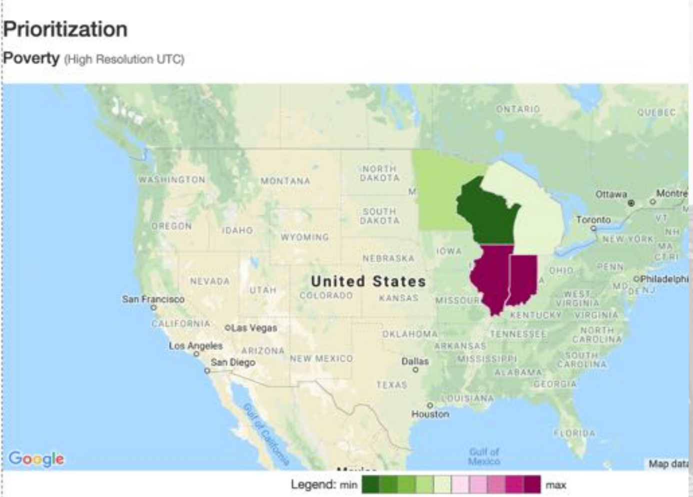


Tree Benefits

Carbon and CO2 (High Resolution UTC)

	Carbon Storage		Carbon Sequestration		CO$_2$ Equivalent Storage		CO$_2$ Equivalent Sequestration	
	$	Short Ton	$/yr	t/yr	$	Short Ton	$/yr	t/yr
Selection Total:	301,989,286,041	1,770,671,305.9	5,050,664,159	29,613,852.3	301,989,286,041	6,492,461,454.8	5,050,664,159	108,584,125.0





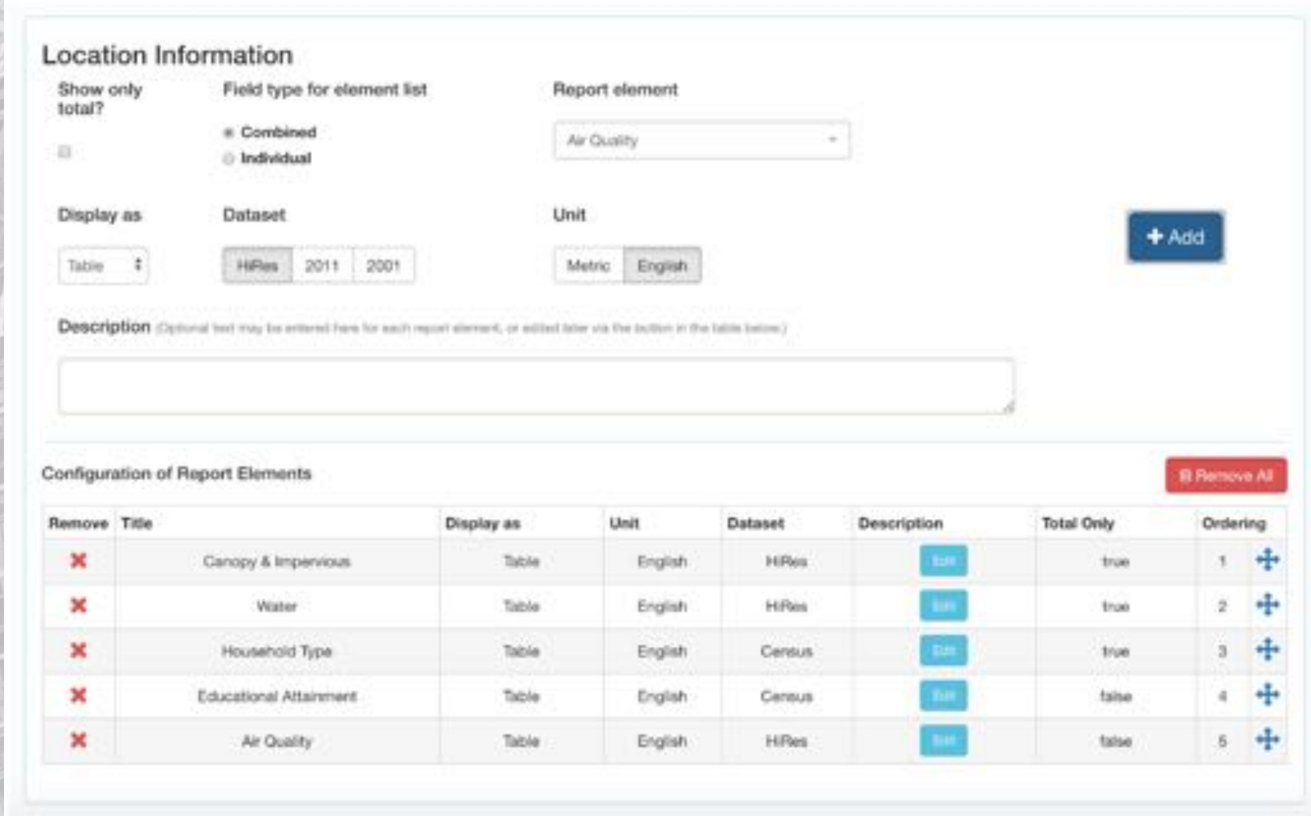
Prioritization

Poverty (High Resolution UTC)

United States
ONTARIO
QUEBEC
WASHINGTON
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
OREGON
IDAHO
WYOMING
NEBRASKA
IOWA
NEVADA
UTAH
COLORADO
KANSAS
MISSOURI
San Francisco
CALIFORNIA
Las Vegas
Los Angeles
San Diego
ARIZONA
NEW MEXICO
OKLAHOMA
ARKANSAS
TEXAS
Dallas
Houston
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
TENNESSEE
KENTUCKY
OHIO
WEST VIRGINIA
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
FLORIDA
PENN
NEW YORK
Toronto
Ottawa
Philadelphia
Gulf of Mexico
Gulf of California
Google
Map data
Legend: min
max

GENERATE RESULTS

- Show Only Total? – Check this box if you would like only the total for your selection group to be displayed in your results. Leave this box unchecked to show the total and the results of each individual selection group.
- Unit – Choose to view your location data in "Metric" or "English" units.
- Dataset – Choose the dataset that you would like your location data to be based on by clicking one of the following buttons:
  - "HiRes" – data are based on high resolution land cover data, however depending on your location this data may or may not be available.
  - "2011" – data are based on the 2011 National Land Cover Database.
  - "2001" – data are based on the 2001 National Land Cover Database.



Location Information

Show only total? ☐

Field type for element list: ● Combined ○ Individual

Report element: Air Quality

Display as: Table

Dataset: HiRes | 2011 | 2001

Unit: Metric | English

Description

Configuration of Report Elements

Remove	Title	Display as	Unit	Dataset	Description	Total Only	Ordering
✕	Canopy & Impervious	Table	English	HiRes	Edit	true	1
✕	Water	Table	English	HiRes	Edit	true	2
✕	Household Type	Table	English	Census	Edit	true	3
✕	Educational Attainment	Table	English	Census	Edit	false	4
✕	Air Quality	Table	English	HiRes	Edit	false	5

GENERATE RESULTS

- Description – Add optional text to help describe your report element.

The elements that will be included in your project's report will all be listed in the Configuration of Report Elements section. In this section you can pick which sections you would like to:

- Remove – Click on the X in the Remove column of the data table. This will remove an element from your report.
- Ordering – Click on the arrow symbol in the Ordering column of the table and drag up or down in an order of your liking.

When you have customized the report to your liking, click Done to view and choose the layout of your results. Use your Internet browser's print function to print the results that are displayed on this page. Everything within the dashed border will be printed from this page.