NEW TOOLS FOR URBAN FORESTRY

University of Massachusetts Amherst
BE REVOLUTIONARY™

DAVID BLONIARZ, US FOREST SERVICE

WWW.UNRI.ORG/RESEARCH-DOCUMENTS

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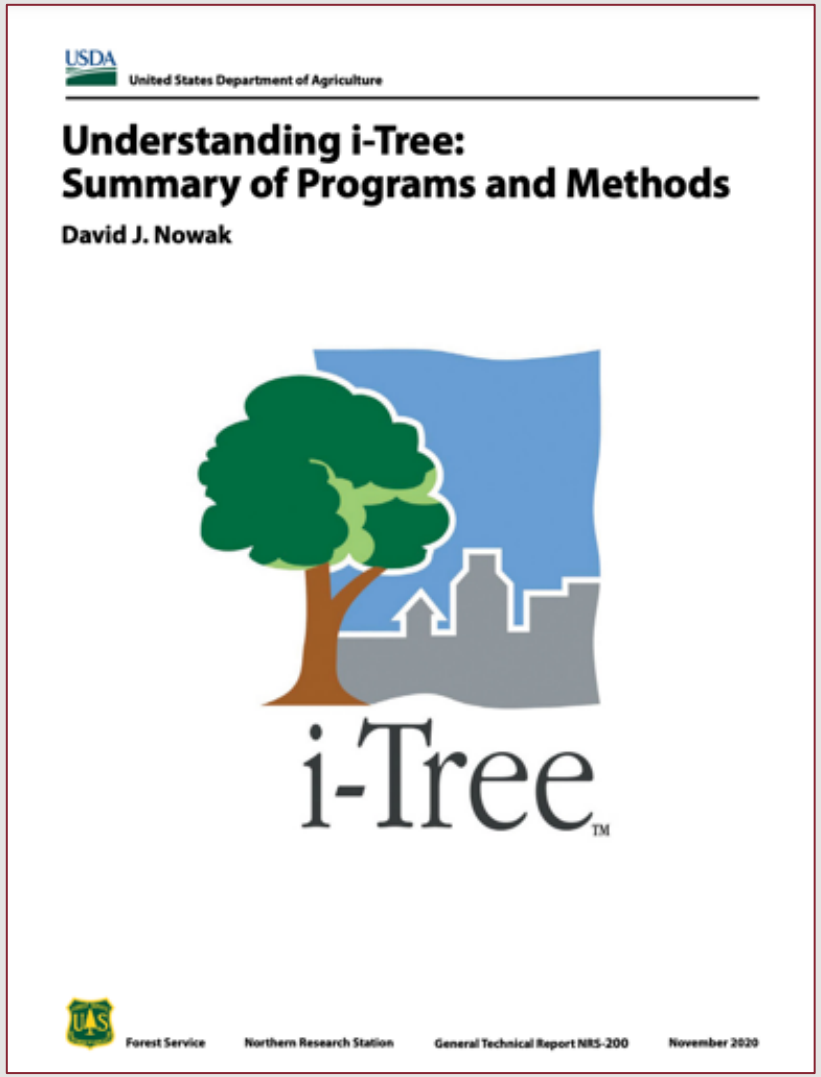
University of Massachusetts Amherst BE REVOLUTIONARY™

OVERVIEW

- Understanding i-Tree: Summary of Programs and Methods
- i-Tree Pocket Guide
- MyTree 2.0
- EpiCollect Data Collection Tool
- Urban Tree Monitoring: A Field Guide
- Urban Tree Monitoring: A Resource Guide
- Urban Wood Marketplace
- STEW-MAP (Stewardship Mapping & Assessment Project)
- NASA's Globe Observer Citizen Science Program
- i-Tree Greenhouse Gas Calculator (Planting)
- Google Tree Canopy Lab
- American Forests Tree Equity Score Analyzer (TESA)
- Vibrant Cities Lab Urban Forestry Toolkit

I-TREE PROGRAM & METHODS USER'S MANUAL

- Comprehensive User's Guide.
- Complete Scientific Overview of Each Application.
- Choosing the Most Appropriate tool(s).



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www.itreetools.org

i-Tree Quick Guide

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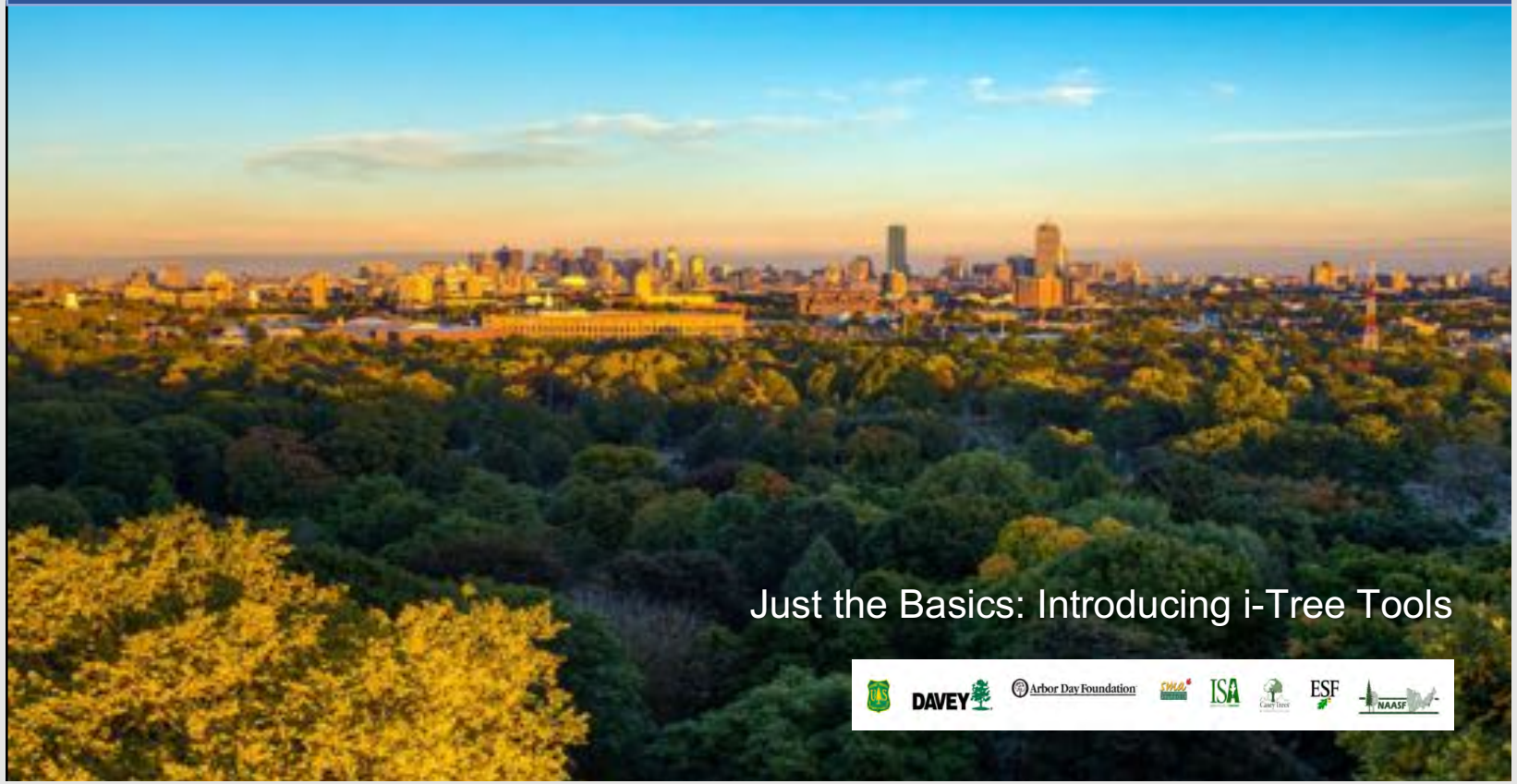


i-TREE 2020

ABOUT I-TREE

The i-Tree suite of software tools was developed by the USDA Forest Service and their cooperators to help users assess and manage the structure, function, and value of trees and forests regardless of community size or technical capacity. i-Tree supports effective natural resource management by providing information for advocacy, planning, informed decision-making, and standardization for monitoring. It promotes a better understanding of the ecosystem services provided by trees and forests, and helps justify investment in stewardship, operations, and maintenance.

WHAT DOES I-TREE DO?

i-Tree provides the tools to help you promote strategic, cost-effective forest management and by helping you:

- Determine and understand tree and forest benefits, values and management costs.
- Plan and manage to optimize tree and forest environmental services to benefit people.
- Integrate trees and forests in green infrastructure strategies and resilience planning.
- Identify potential pests, diseases and threats.

i-Tree online tools can be accessed and used directly on the i-Tree website. Desktop applications require installing software and offer instruction manuals and learning resources to plan and complete a project.

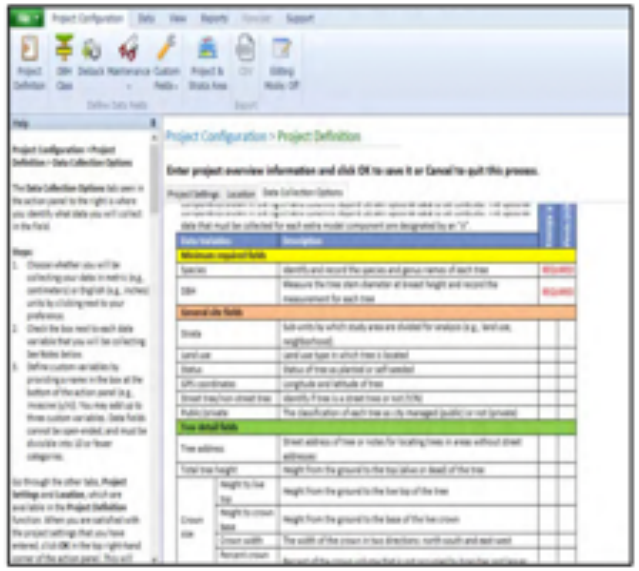
I-TREE 2020 DESKTOP APPLICATIONS

- ***Eco v6*** uses field data from complete inventories or sampled plots with local hourly air pollution and meteorological data to quantify forest structure, environmental effects, and values. ****Int'l***
- ***Hydro*** simulates the effects of changes in tree and impervious cover on hourly stream flow and water quality. Hydro has a user-friendly interface, pre-calculated topographic indexes that eliminate the need for GIS expertise, and applicability for non-watershed areas.
- **Streets** estimates structure and ecosystem services for street trees using a sample or complete inventory option.

I-TREE 2020 ONLINE APPLICATIONS

- ***Landscape*** allows you to explore geospatial data for an area of interest.
- ***Design*** assesses how tree species, size, and affect benefits including energy use in nearby structures.
- ***Canopy*** produces a statistical estimate of tree and other land cover types using Google Maps. ****Int'l***
- ***MyTree*** calculates individual tree benefits on a smartphone or tablet.
- ***Species*** aids in tree species selection based on desired environmental services and geographic area.
- ***Planting*** estimates the long-term environmental benefits of tree planting projects.
- ***Database*** is an online system for international users to submit new location, pollution, precipitation data, and new species for integration into the Eco model. ****Int'l***

i-TREE ECO



WHAT: i-Tree Eco is a flexible software application designed to use data collected in the field from single trees, complete inventories, or randomly located plots throughout a study area along with local hourly air pollution and meteorological data to quantify forest structure, environmental effects, and value to communities.

HOW: i-Tree Eco provides extensive forest and individual tree analyses including the following:

- Pollution removal and human health impacts
- Carbon sequestration and storage
- Hydrology effects (avoided run-off, interception, transpiration)
- Building energy effects
- Tree bio-emissions
- Wildlife suitability (plot-based projects; limited to 9 bird species)
- Ultraviolet radiation (UV) tree effects
- Species condition and distribution
- Leaf area and biomass
- Species importance values
- Diversity indices and relative performance
- Tree planting inputs
- Pest risk analysis
- User defined optional fields
- Cost benefit analysis

MYTREE 2.0

- MyTree is intended to be simple and accessible. As such, this tool should be considered a starting point for understanding trees' value in the community, rather than a scientific accounting of precise values.

- With inputs of location, species and tree size, users will get an understanding of the environmental and economic value trees provide on an annual basis.

MYTREE 2.0

- One of most popular tools for public engagement.
- Citizen-science tool for all ages.
- Quantifies and calulates function and value of tree(s).

MyTree Benefits

Serving size: 1 tree

TOTAL BENEFITS FOR THIS YEAR	$
Carbon Dioxide (CO_2) Sequestered	$
CO_2 absorbed each year	lbs
Storm Water	$
Rainfall intercepted each year	gal.
Air Pollution removed each year	$
Ozone	oz
Nitrogen dioxide	oz
Sulfur dioxide	oz
Large particulate matter**	oz
Energy Usage each year*	$
Electricity savings (A/C)	kWh
Fuel savings (NG/Oil)	therms
Avoided Emissions	
Carbon dioxide	lbs
Nitrogen dioxide	oz
Sulfur dioxide	oz
Large particulate matter**	oz

Benefits are estimated based on USDA Forest Service research and are meant for guidance only www.itreetools.org

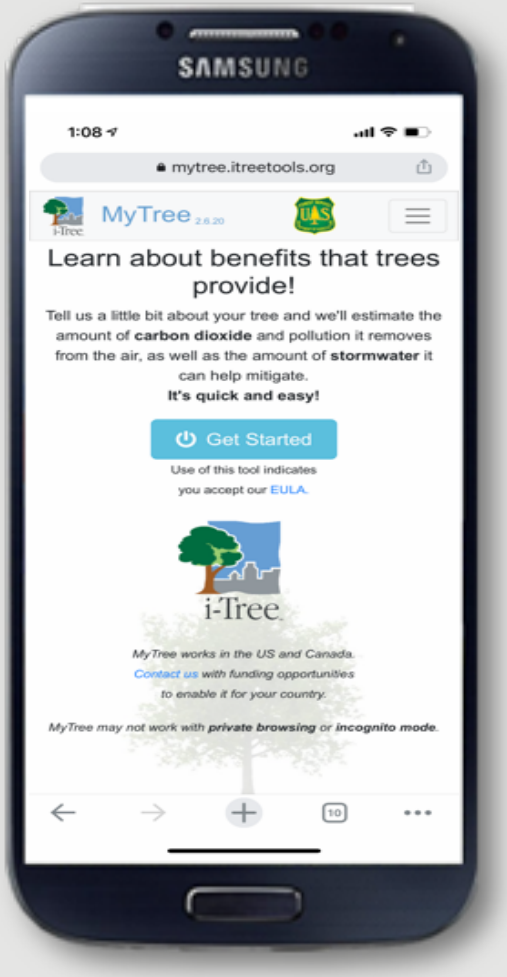
*Positive energy values indicate savings or reduced emissions. Negative energy values indicate increased usage or emissions.

**is not greater than 10 microns

www.itreetools.org

MYTREE 2.0

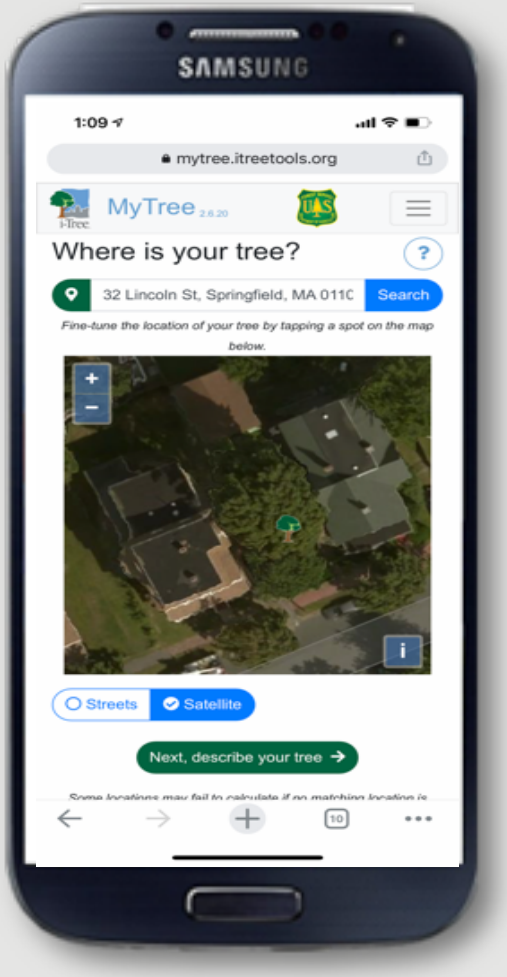
MYTREE 2.0



- MyTree is generally used in the field to deliver quick results on the ecosystem services provided by one or more trees, and as such, is most practically used on a laptop, tablet or smartphone.

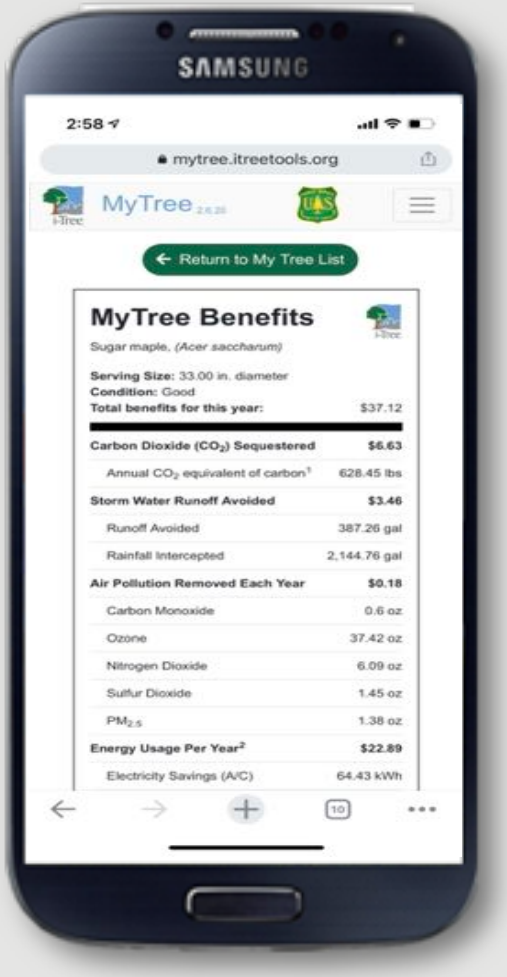
- Tree data is input via the computer or mobile device and the program will provide an easy to understand ‘tree nutrition’ label which can be saved or printed.

MYTREE 2.0



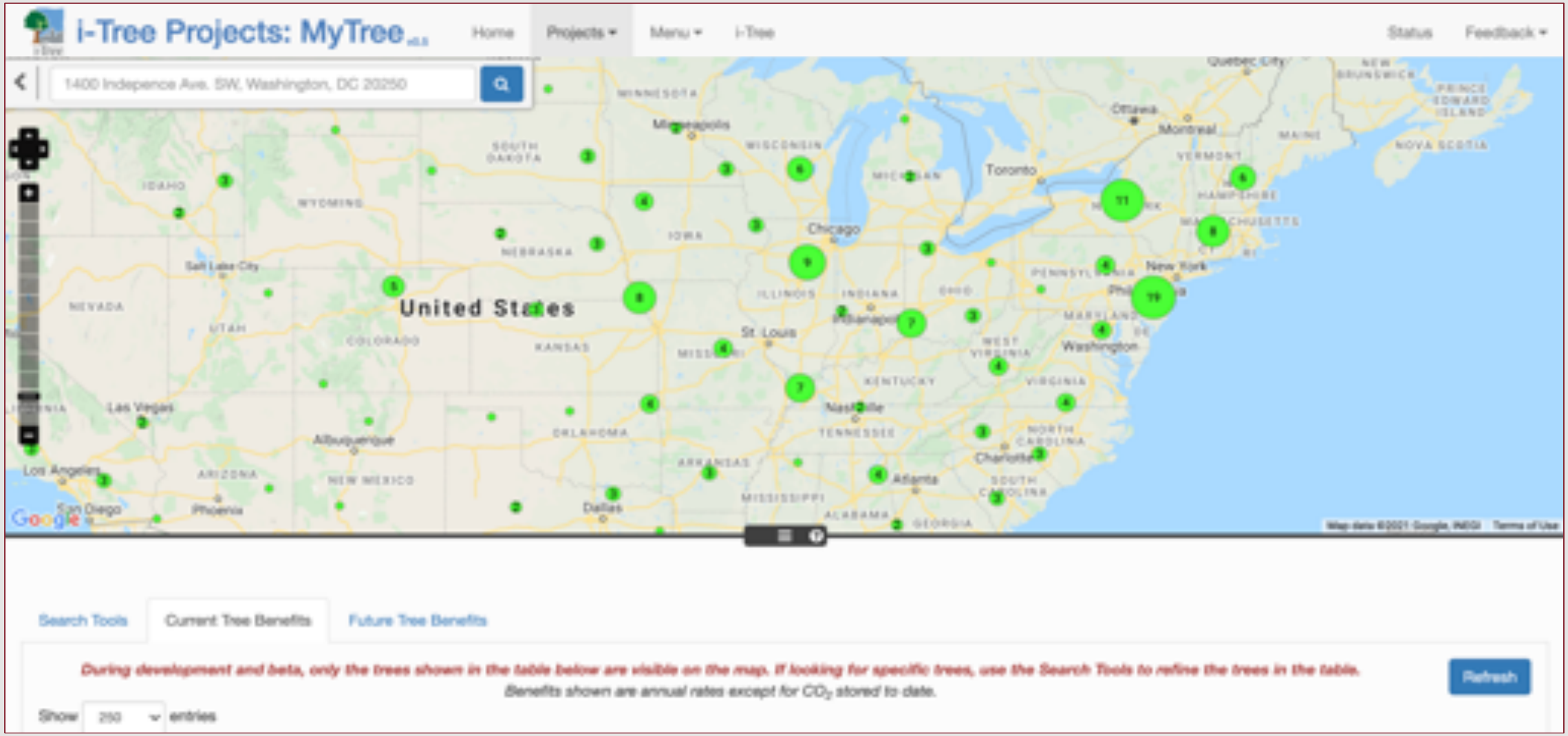
- Includes new Google Map component.
- Adds versatility and usefulness.
- Enables cooperative data input and analysis by ‘pinning’ trees to the world-wide map and database.

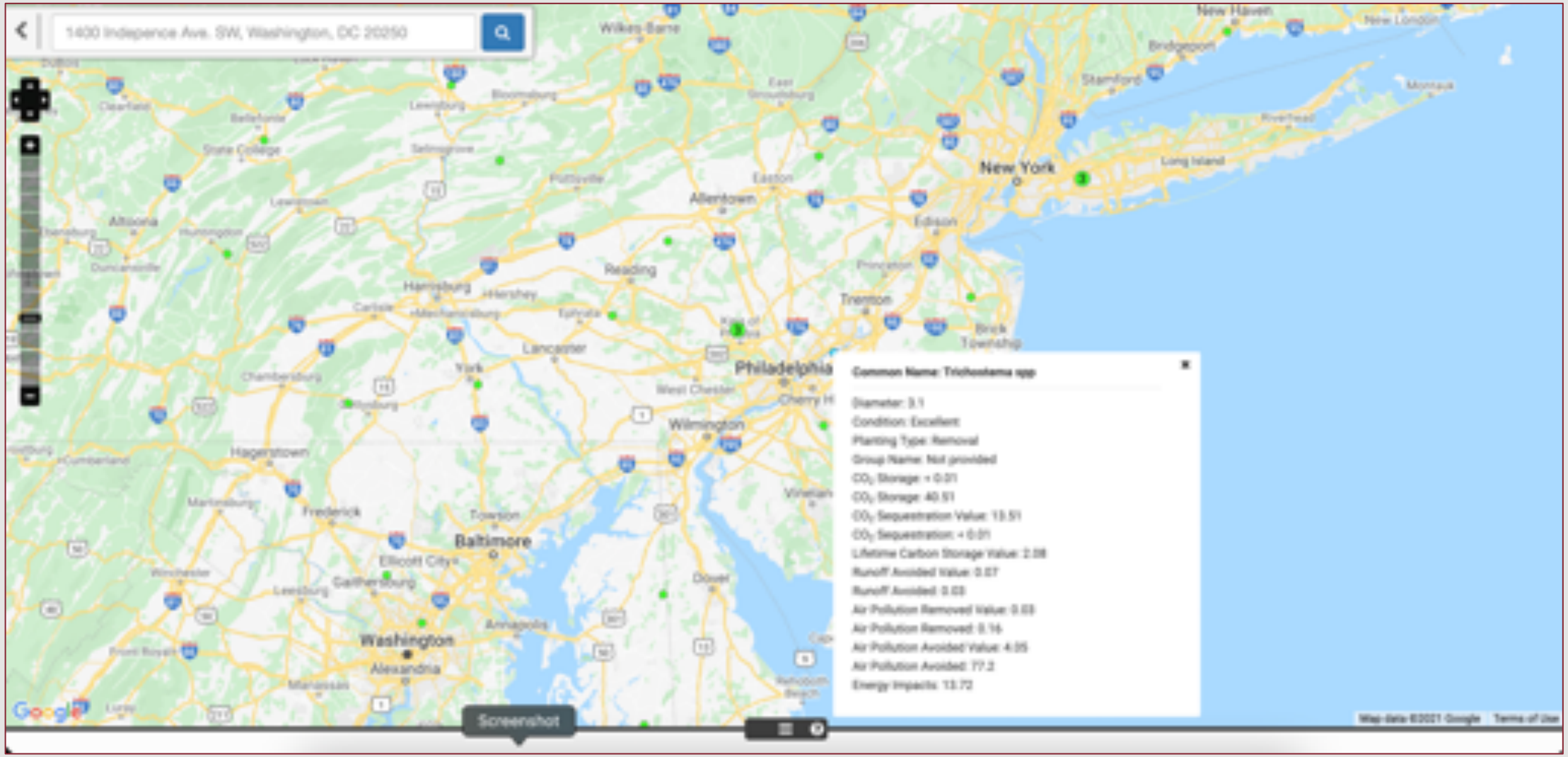
MYTREE 2.0



- Provides easy to read and understand graphic report.
- Results can be viewed, downloaded or printed.
- Utilizes databases from i-Tree Eco and Design to produce accurate, peer-reviewed and consistent data reporting.


i-Tree Projects: MyTree
Home
Projects
Menu
i-Tree
Status
Feedback
1400 Indepence Ave. SW, Washington, DC 20250
Search Tools
Current Tree Benefits
Future Tree Benefits
During development and beta, only the trees shown in the table below are visible on the map. If looking for specific trees, use the Search Tools to refine the trees in the table.
Benefits shown are annual rates except for CO_2 stored to date.
Refresh


i-Tree Projects: MyTree
Home
Projects
Menu
i-Tree
Status
Feedback
1400 Independence Ave. SW, Washington, DC 20250
United States
Chicago
Toronto
Ottawa
Montreal
New York
Washington
St. Louis
Minneapolis
Salt Lake City
Las Vegas
Los Angeles
San Diego
Phoenix
Albuquerque
Dallas
Atlanta
Charlotte
Nashville
Search Tools
Current Tree Benefits
Future Tree Benefits
During development and beta, only the trees shown in the table below are visible on the map. If looking for specific trees, use the Search Tools to refine the trees in the table.
Benefits shown are annual rates except for CO_2 stored to date.
Refresh
Show 250 entries


1400 Independence Ave. SW, Washington, DC 20250
Common Name: Trichoshama spp
Diameter: 3.1
Condition: Excellent
Planting Type: Removal
Group Name: Not provided
CO_2 Storage: < 0.01
CO_2 Storage: 40.51
CO_2 Sequestration Value: 13.51
CO_2 Sequestration: < 0.01
Lifetime Carbon Storage Value: 2.08
Runoff Avoided Value: 0.07
Runoff Avoided: 0.03
Air Pollution Removed Value: 0.03
Air Pollution Removed: 0.16
Air Pollution Avoided Value: 4.05
Air Pollution Avoided: 77.2
Energy Impacts: 13.72
Screenshot
Google
Map data ©2021 Google
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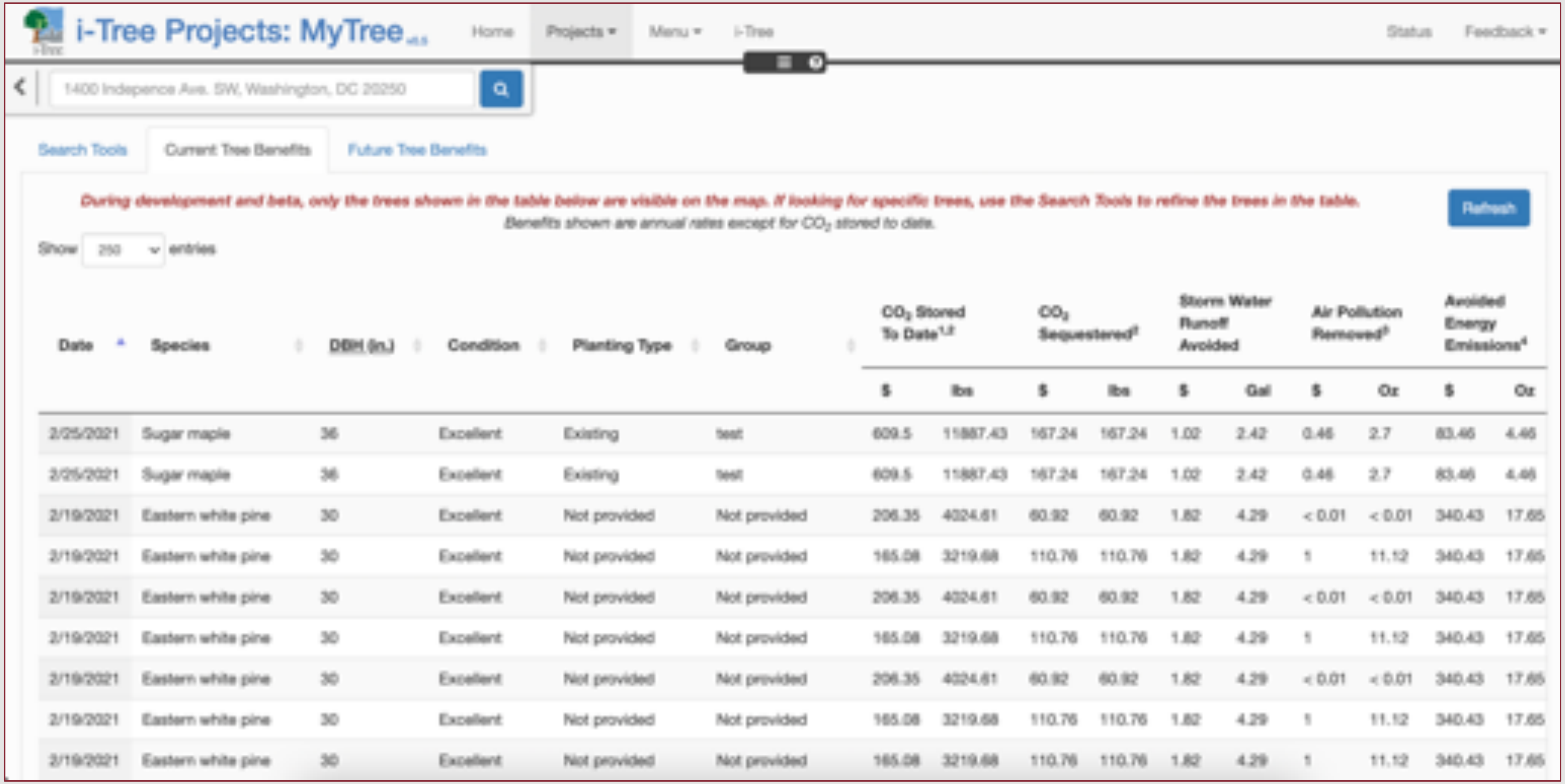
i-Tree Projects: MyTree

Home | Projects ▾ | Menu ▾ | i-Tree | Status | Feedback ▾

1400 Independence Ave. SW, Washington, DC 20250

Search Tools | Current Tree Benefits | Future Tree Benefits

During development and beta, only the trees shown in the table below are visible on the map. If looking for specific trees, use the Search Tools to refine the trees in the table.

Benefits shown are annual rates except for CO_2 stored to date.

Refresh

Show 250 entries

Date	Species	DBH (in.)	Condition	Planting Type	Group	CO_2 Stored To Date[1,2]		CO_2 Sequestered[2]		Storm Water Runoff Avoided		Air Pollution Removed[3]		Avoided Energy Emissions[4]	
						$	lbs	$	lbs	$	Gal	$	Oz	$	Oz
2/25/2021	Sugar maple	36	Excellent	Existing	test	609.5	11887.43	167.24	167.24	1.02	2.42	0.46	2.7	83.46	4.46
2/25/2021	Sugar maple	36	Excellent	Existing	test	609.5	11887.43	167.24	167.24	1.02	2.42	0.46	2.7	83.46	4.46
2/19/2021	Eastern white pine	30	Excellent	Not provided	Not provided	206.35	4024.61	60.92	60.92	1.82	4.29	< 0.01	< 0.01	340.43	17.65
2/19/2021	Eastern white pine	30	Excellent	Not provided	Not provided	165.08	3219.68	110.76	110.76	1.82	4.29	1	11.12	340.43	17.65
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2/19/2021	Eastern white pine	30	Excellent	Not provided	Not provided	165.08	3219.68	110.76	110.76	1.82	4.29	1	11.12	340.43	17.65

1/15/2021	Tetrochidium spp	6.3	Excellent	Existing	Not provided	9.24	180.24	20.69	20.69	0.12	0.29	0.14	0.01	62.84	3.27
1/15/2021	Toxocarpus spp	3.1	Excellent	Existing	Not provided	1.72	33.55	5.52	5.52	0.08	0.19	0.06	0.02	51.99	2.72
1/15/2021	Prismatomeris spp	7.5	Excellent	Existing	Not provided	15.14	295.29	43.45	43.45	0.05	0.12	0.17	0.08	16.09	0.85
1/15/2021	Anthopterus spp	3.5	Excellent	Existing	C - Example Group	2.18	42.58	20.14	20.14	0.14	0.34	0.1	< 0.01	26.59	1.43
1/15/2021	Sprengelia spp	3.9	Excellent	Existing	C - Example Group	2.82	54.95	16.57	16.57	0.01	0.03	0.09	0.04	22.2	1.14
1/15/2021	Parashorea spp	3.5	Excellent	Existing	Not provided	2.27	44.32	9.72	9.72	< 0.01	0.02	0.05	0.04	58.7	3
1/15/2021	Voacanga spp	7.9	Excellent	Existing	Not provided	13.08	255.17	34.01	34.01	< 0.01	0.01	0.28	0.1	158.85	8.12
1/15/2021	Ricinodendron spp	2.4	Excellent	Existing	A - Example Group	0.67	13.11	5.5	5.5	0.05	0.11	0.05	0.01	64.41	3.34
1/15/2021	Apacheria spp	3.9	Excellent	Existing	Not provided	2.03	39.54	8.48	8.48	< 0.01	< 0.01	0.14	0.01	24.49	1.26
1/15/2021	Westringia spp	5.5	Excellent	Existing	Not provided	6.92	134.98	25.16	25.16	0.1	0.25	0.12	0.03	60.36	3.13
1/15/2021	Cameraria spp	7.5	Excellent	Existing	C - Example Group	11.67	227.54	43.93	43.93	0.31	0.74	0.27	0.03	116.93	6.08
1/15/2021	Ricinodendron spp	3.9	Excellent	Existing	C - Example Group	2.71	52.9	18.32	18.32	< 0.01	< 0.01	0.15	0.03	73.1	3.74
1/15/2021	Philippia spp	5.5	Excellent	Existing	B - Example Group	6.36	124.08	42.82	42.82	0.33	0.79	0.15	0.97	60.3	3.3
1/15/2021	Perebea spp	2.4	Excellent	Existing	Not provided	0.9	17.46	15.7	15.7	0.28	0.66	0.08	0.58	17.01	0.94
1/15/2021	Heterocentron spp	4.3	Excellent	Existing	Not provided	3.52	68.62	14.92	14.92	0.06	0.14	0.05	0.68	97.81	5.18
1/15/2021	Microchites spp	2.4	Excellent	Existing	Not provided	0.92	17.9	5.78	5.78	< 0.01	< 0.01	0.07	0.02	44.98	2.3
1/15/2021	Sarcostemma spp	5.5	Excellent	Existing	Not provided	5.91	115.28	15.57	15.57	< 0.01	0.01	0.13	0.03	56.63	2.89
2/16/2021	Bixby walnut	10	Excellent	-1	Not provided	29.25	570.52	105.29	105.29	0.64	1.51	0.47	3.89	16.7	0.93

Showing 1 to 250 of 2,021 entries

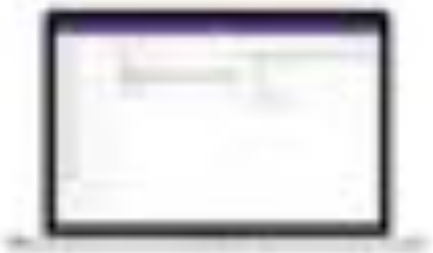
Previous 1 2 3 4 5 … 9 Next


MyTree in
the
Classroom

EPI COLLECT

- Free, simple to use data collector suite
- Easy, convenient and accurate
- Desktop configuration and data management
- Mobile app for field data collection
- Sync data via the cloud

epicollect5



Create your project and forms on the website

Download project on device and collect data online or offline

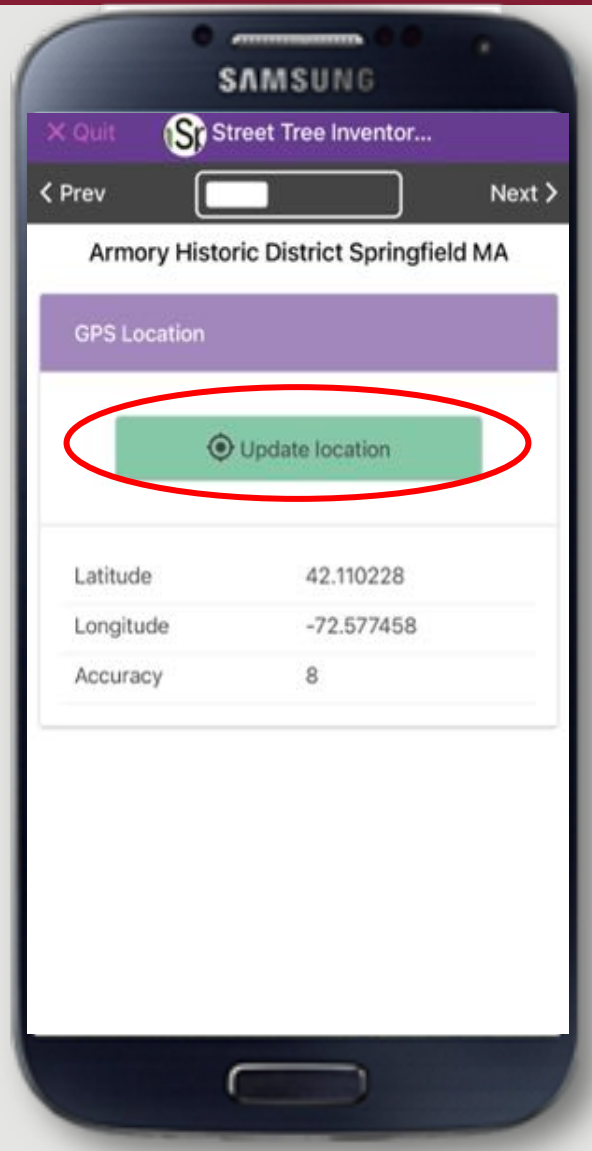
View, analyse and export your data (json, csv)

EPI COLLECT

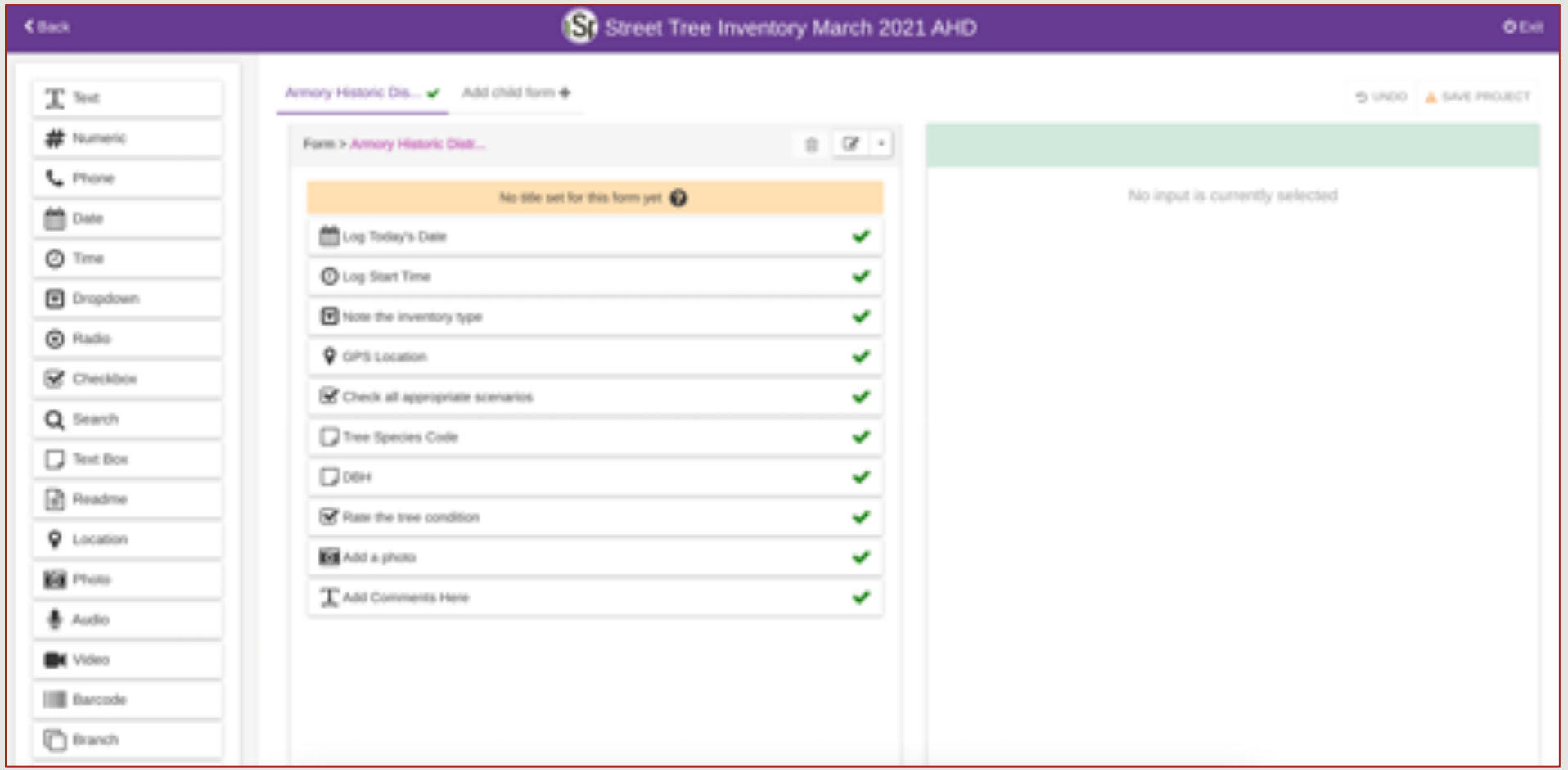
- Ideal for tree inventories, inspection and sales applications
- Multiple forms for specialized data collection needs
- Location, photos and video can be collected

EPI COLLECT – DATA COLLECTION

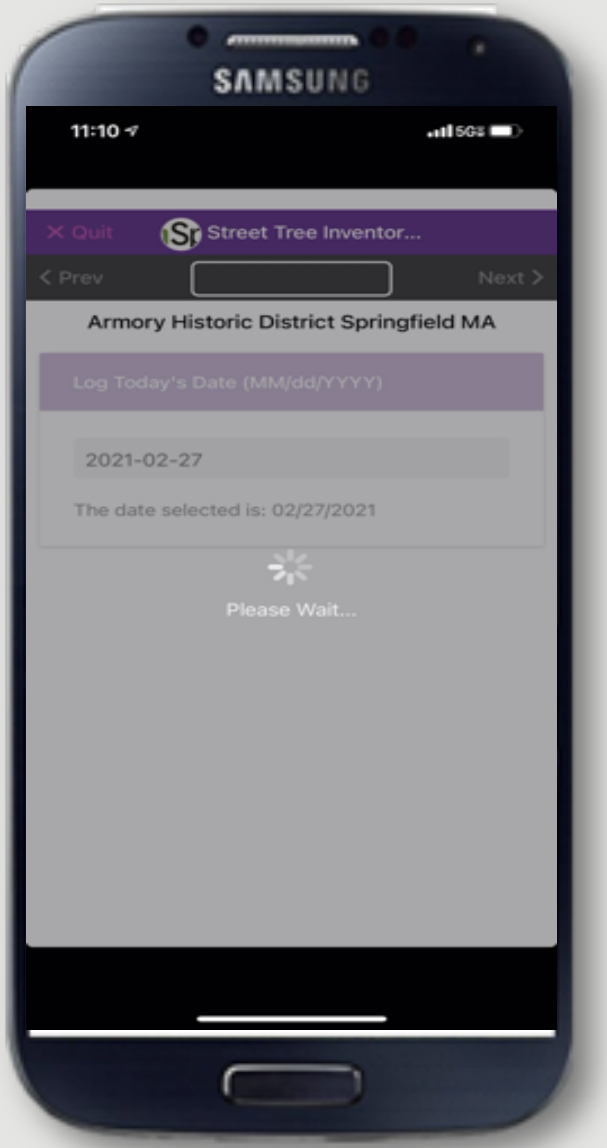
- Simple user interface for smartphones and tablets.
- Customizable data collection.
- Easy to modify via the configuration interface.



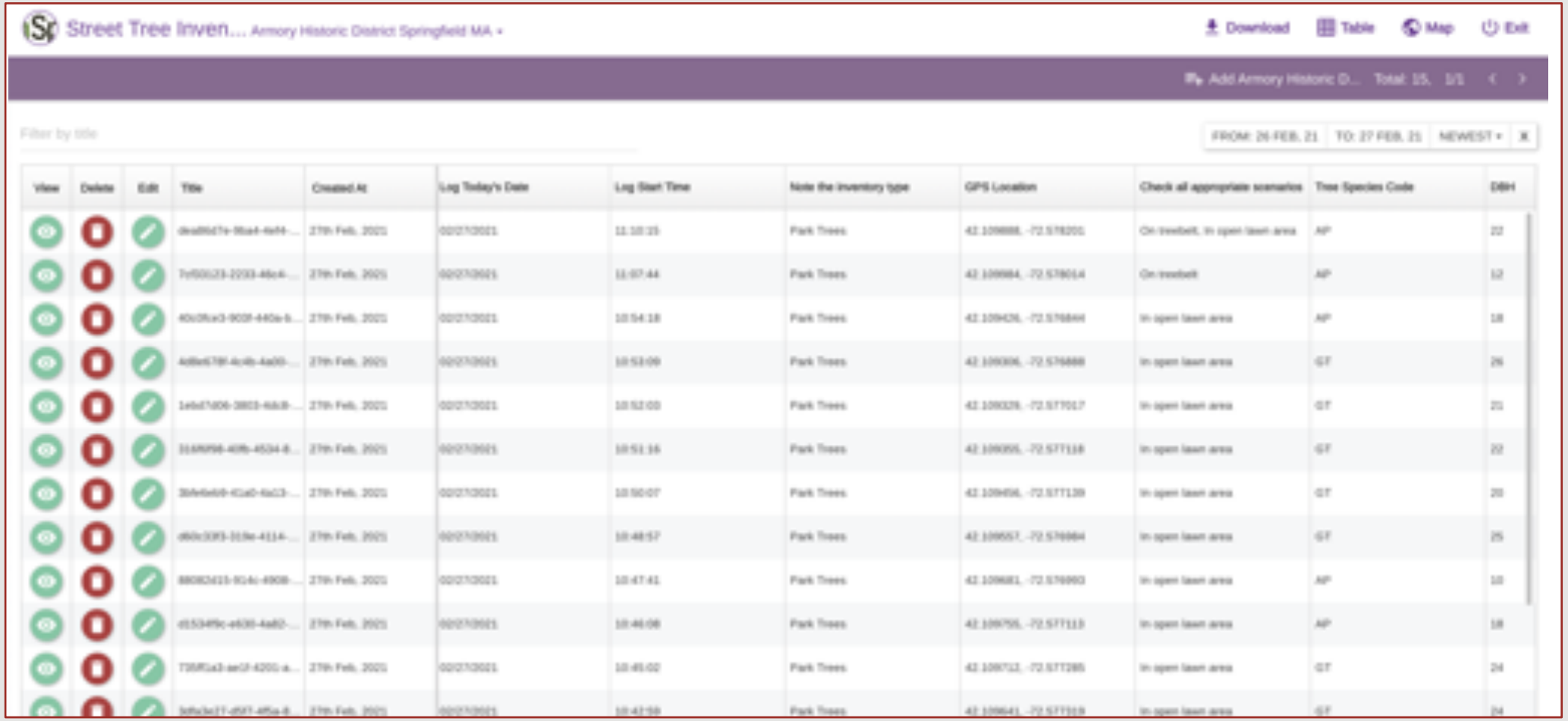
EPI COLLECT – DESKTOP CONFIGURATION



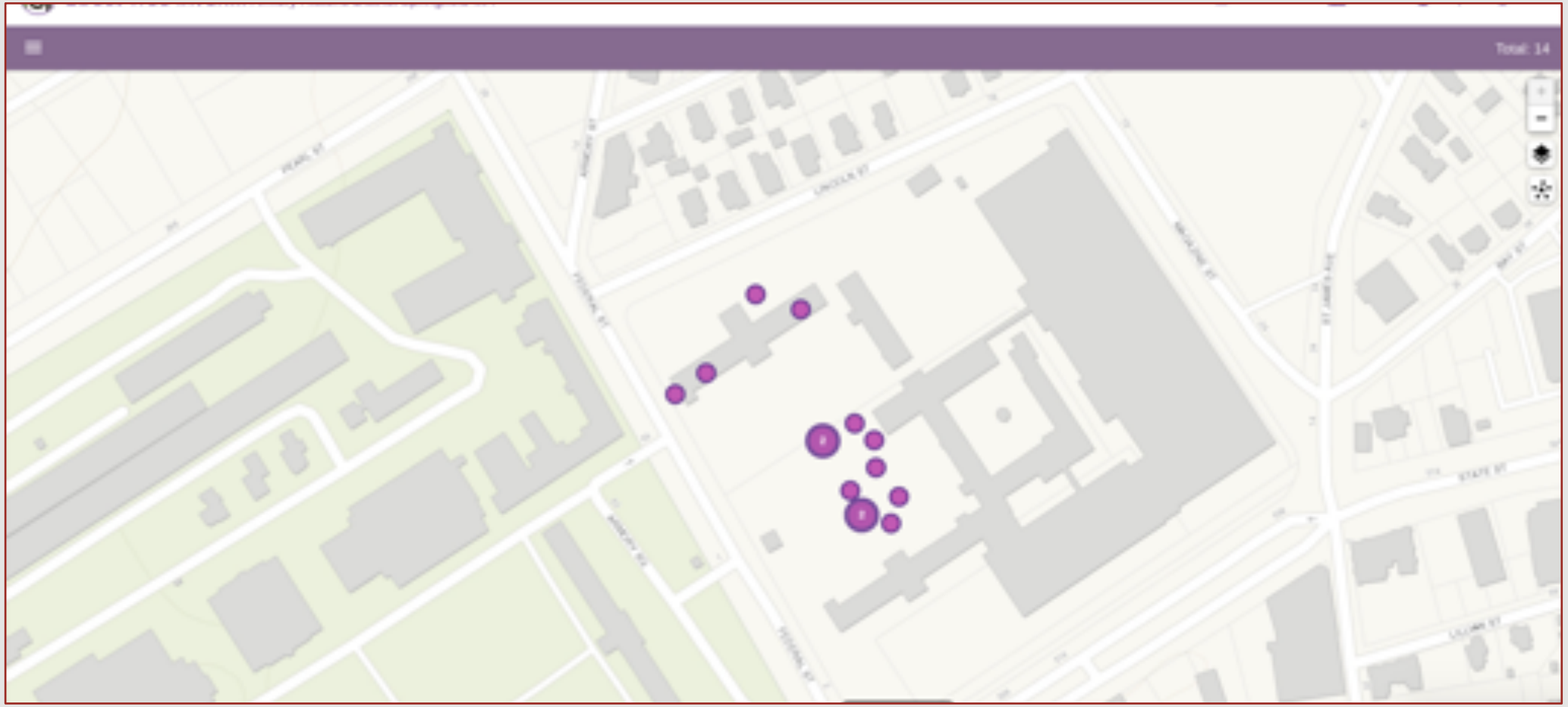
EPI COLLECT WALK-THRU



EPI COLLECT DESKTOP DATA MANAGEMENT



EPI COLLECT DESKTOP DATA MANAGEMENT



EPI COLLECT

- Export data to Google Maps, i-Tree or ArcGIS.
- Archive Database in the Cloud or Desktop.
- User Community of Shared Forms

USDA
United States Department of Agriculture

Urban Tree Monitoring: A Field Guide

Forest Service | Northern Research Station | General Technical Report NRS-194 | August 2020

USDA
United States Department of Agriculture

Urban Tree Monitoring: A Resource Guide

Forest Service
Pacific Southwest Research Station
General Technical Report PSW-266
August 2020

USDA
United States Department of Agriculture

Urban Tree Monitoring: A Resource Guide

Forest Service
Pacific Southwest Research Station
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August 2020

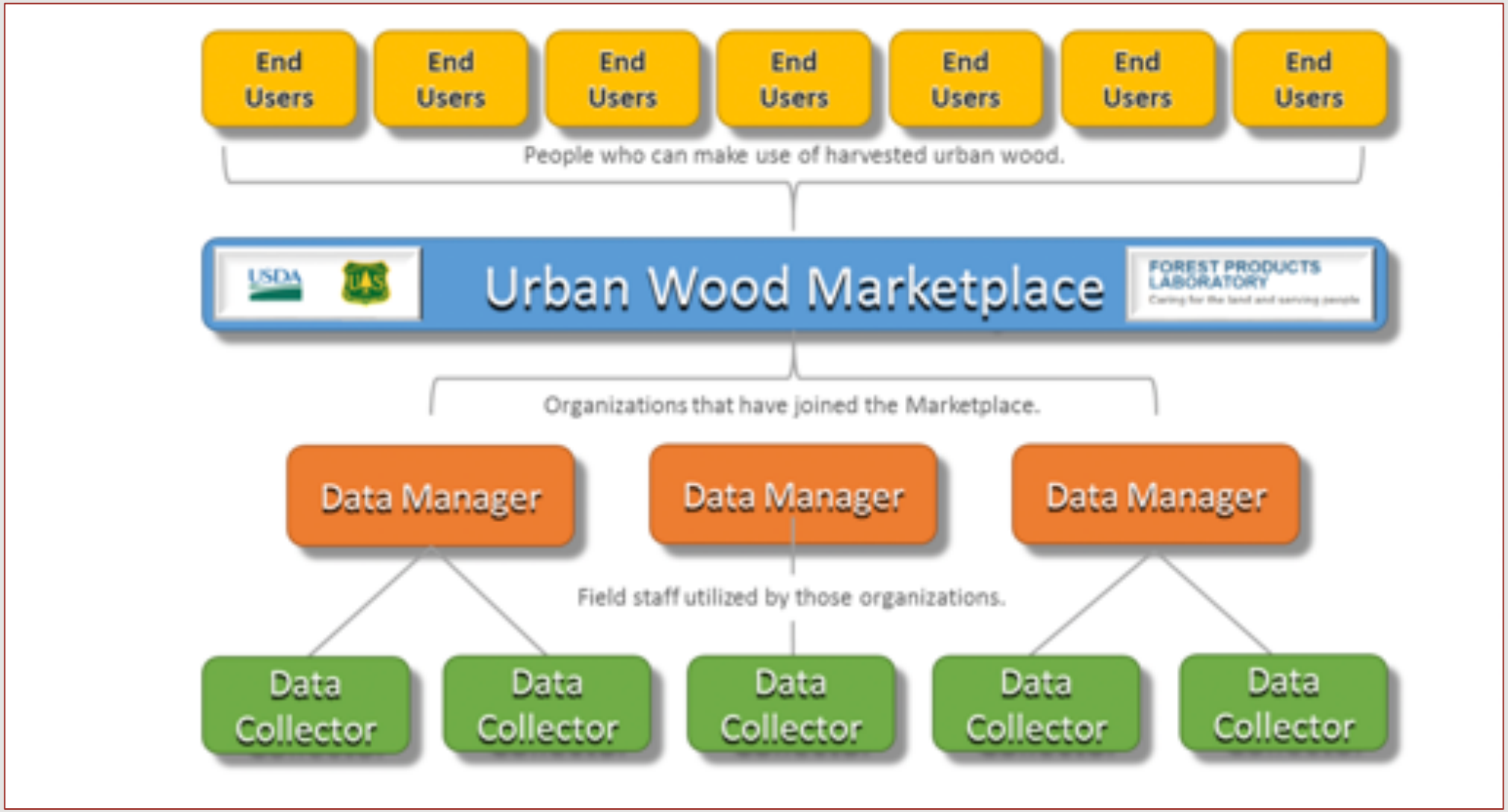
URBAN WOOD MARKETPLACE

- Providing a unified and simple tool to connect urban wood harvests to the users of those removed trees, and thereby reduce waste.
- Commercial and municipal applicability.
- Web-based.

URBAN WOOD MARKETPLACE

- The site is comprised of the **Marketplace** and the **Data Collection Tool**. Data are organized by Job, which consists of one or more trees a organization has felled.

- Trees are subdivided into logs, which are located at a storage yard of the harvesting organization.


End Users
End Users
End Users
End Users
End Users
End Users
End Users
People who can make use of harvested urban wood.
USDA
Urban Wood Marketplace
FOREST PRODUCTS LABORATORY
Organizations that have joined the Marketplace.
Data Manager
Data Manager
Data Manager
Field staff utilized by those organizations.
Data Collector
Data Collector
Data Collector
Data Collector
Data Collector

URBAN WOOD MARKETPLACE

How the log information is organized and collected: Jobs > Trees > Logs

An organization joins the Marketplace with a designated Marketplace **Data Manager** who can:

- add Jobs, Trees, and Logs.
- invite **Data Collectors** to assist with adding Jobs, Trees, and Logs

The assumption is that one or more **Logs** come from one or more **Trees** at each **Job** site.

Example: a work crew from Anytown is removing a white oak and a red maple at Mrs. Smith's home. Three logs are derived from the oak and one from the maple.

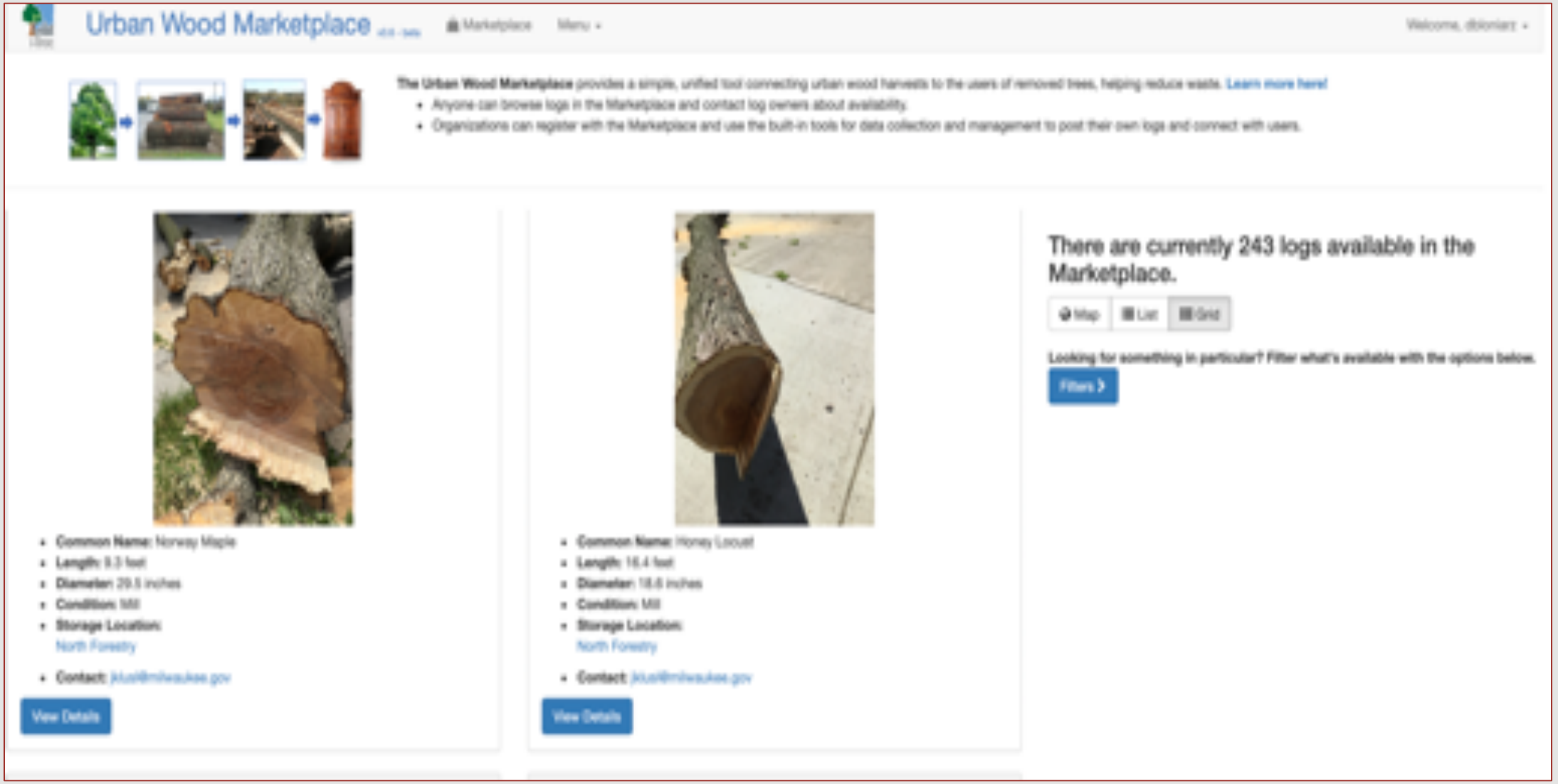
One or more crew members from Anytown have been added as a **Data Collector** by the **Data Manager** for the Anytown (organization). One of these Data Collectors uses a smartphone to log the **Job**, enter the white oak and the 2 viable **Logs** from it, and also enter the red maple for the same Job, with the single **Log** from it.

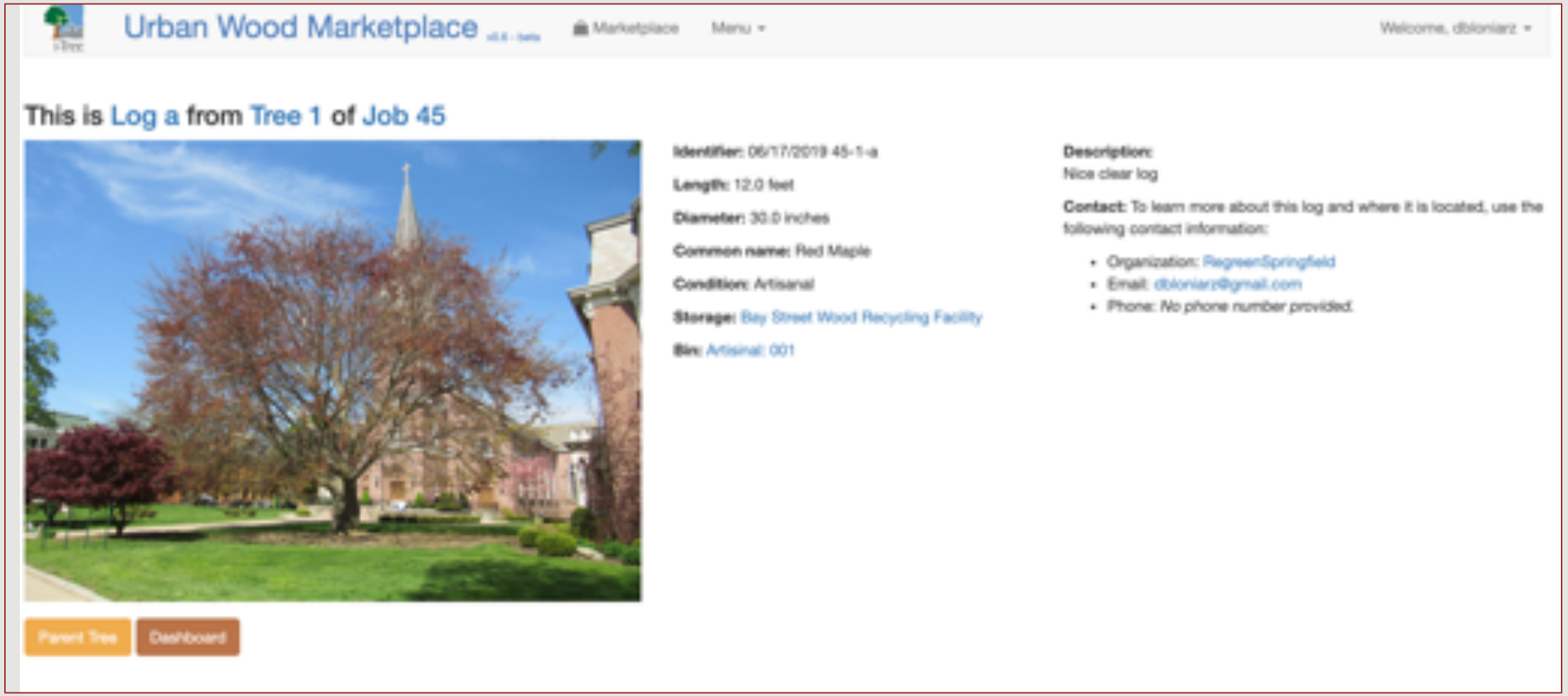
When ready, the Data Manager from Anytown displays these logs in the Marketplace for **End Users** to see.

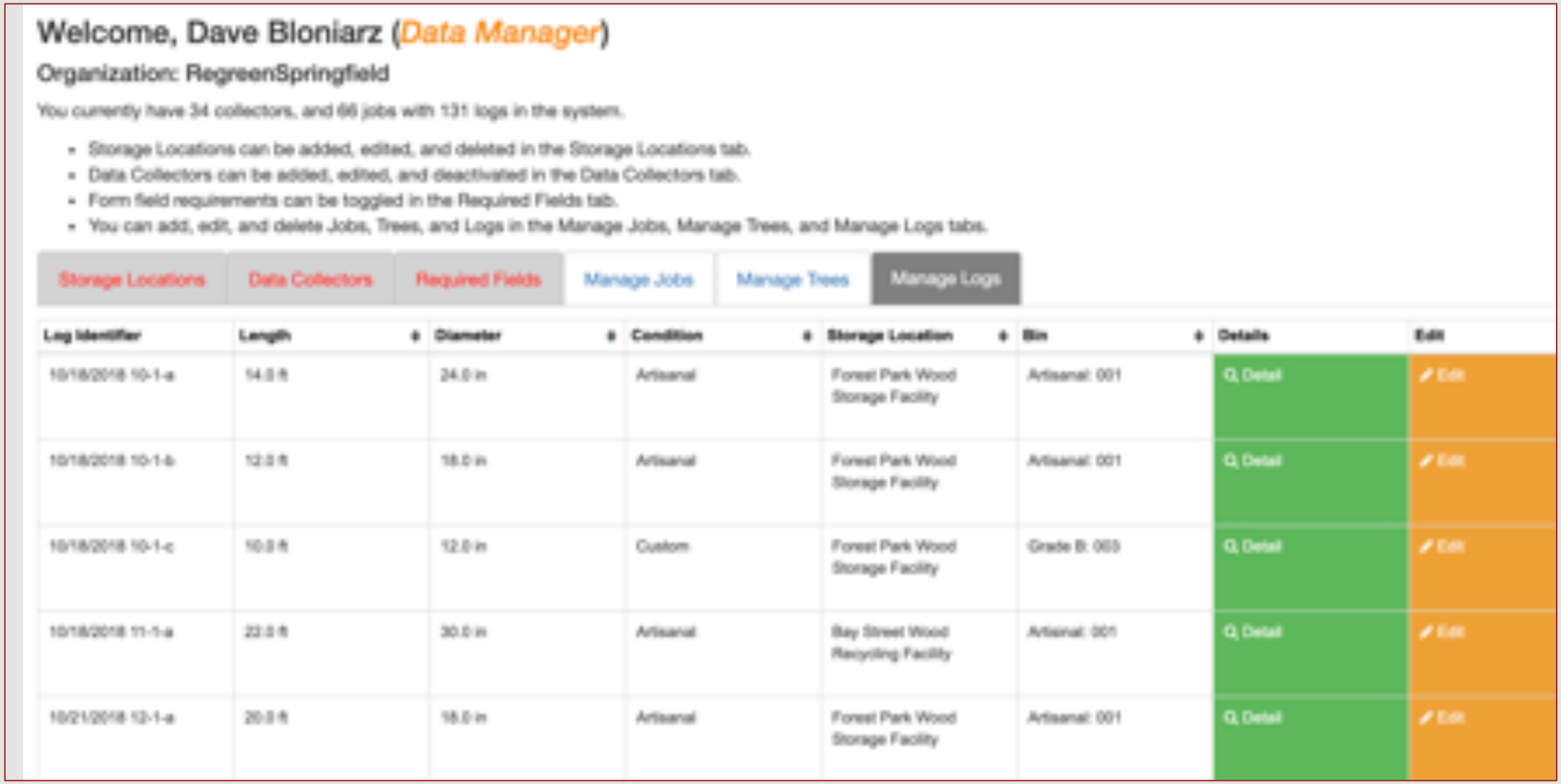
URBAN WOOD MARKETPLACE

Accessing the Marketplace:

- **End Users:** computer, tablet, or phone
- **Data Managers:** computer or tablet (ideally), phone as needed
- **Data Collectors:** phone or tablet (ideally), laptop


Urban Wood Marketplace
Marketplace
Menu
Welcome, dkinian
The Urban Wood Marketplace provides a simple, unified tool connecting urban wood harvests to the users of removed trees, helping reduce waste. Learn more here!
Anyone can browse logs in the Marketplace and contact log owners about availability.
Organizations can register with the Marketplace and use the built-in tools for data collection and management to post their own logs and connect with users.
Common Name: Norway Maple
Length: 9.3 feet
Diameter: 29.5 inches
Condition: Mill
Storage Location:
North Forestry
Contact: jklusi@milwaukee.gov
View Details
Common Name: Honey Locust
Length: 16.4 feet
Diameter: 18.6 inches
Condition: Mill
Storage Location:
North Forestry
Contact: jklusi@milwaukee.gov
View Details
There are currently 243 logs available in the Marketplace.
Map
List
Grid
Looking for something in particular? Filter what's available with the options below.
Filters


Urban Wood Marketplace
Marketplace
Menu
Welcome, dbloniarz
This is Log a from Tree 1 of Job 45
Identifier: 06/17/2019 45-1-a
Length: 12.0 feet
Diameter: 30.0 inches
Common name: Red Maple
Condition: Artisanal
Storage: Bay Street Wood Recycling Facility
Bin: Artisinal: 001
Description:
Nice clear log
Contact: To learn more about this log and where it is located, use the following contact information:
Organization: RegreenSpringfield
Email: dbloniarz@gmail.com
Phone: No phone number provided.
Parent Tree
Dashboard



Welcome, Dave Bloniarz (*Data Manager*)

Organization: RegreenSpringfield

You currently have 34 collectors, and 66 jobs with 131 logs in the system.

- Storage Locations can be added, edited, and deleted in the Storage Locations tab.
- Data Collectors can be added, edited, and deactivated in the Data Collectors tab.
- Form field requirements can be toggled in the Required Fields tab.
- You can add, edit, and delete Jobs, Trees, and Logs in the Manage Jobs, Manage Trees, and Manage Logs tabs.

Storage Locations | Data Collectors | Required Fields | Manage Jobs | Manage Trees | Manage Logs

Log Identifier	Length	Diameter	Condition	Storage Location	Bin	Details	Edit
10/18/2018 10-1-a	14.0 ft	24.0 in	Artisanal	Forest Park Wood Storage Facility	Artisanal: 001	Detail	Edit
10/18/2018 10-1-b	12.0 ft	18.0 in	Artisanal	Forest Park Wood Storage Facility	Artisanal: 001	Detail	Edit
10/18/2018 10-1-c	10.0 ft	12.0 in	Custom	Forest Park Wood Storage Facility	Grade B: 003	Detail	Edit
10/18/2018 11-1-a	22.0 ft	30.0 in	Artisanal	Bay Street Wood Recycling Facility	Artisanal: 001	Detail	Edit
10/21/2018 12-1-a	20.0 ft	18.0 in	Artisanal	Forest Park Wood Storage Facility	Artisanal: 001	Detail	Edit

URBAN WOOD MARKETPLACE

https://wood.treetools.org

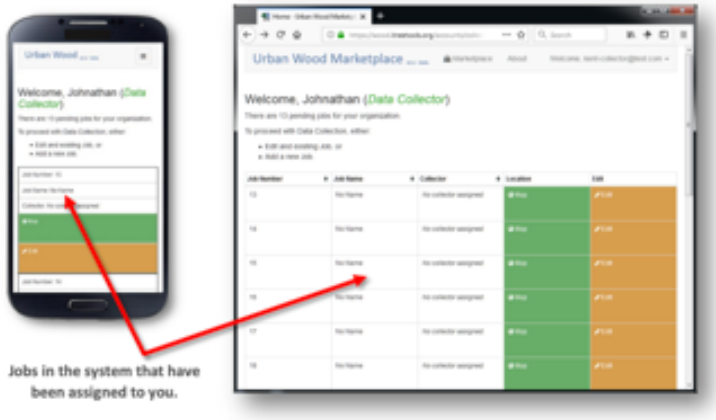
Urban Wood Marketplace Tutorial: Data Collectors

Your role as a Data Collector for the Marketplace is to act as one of your organization's field surveyors who captures the log information that End Users will ultimately review.

- Recording correct information is extremely important and ultimately dictates how well the Marketplace works.
- You may have Jobs assigned to you by your organization's Data Manager.
- You can also add new Jobs in the field.
- With each log you enter, remember to mark it with the unique identifier that the Marketplace assigns to it in the Job form.

Your Data Collection Job List:

- A data connection is needed with your smartphone, tablet, or laptop.
- Smaller screens have a compact view, while larger screens will be more spread out.



Jobs in the system that have been assigned to you.

Working with Jobs:

Map: if adequate location data was entered, click this to see the Job's location on Google Maps.

Edit: open up the Job form so that you can fill it out.

New Job: create a brand new Job form (opens right to the new form).

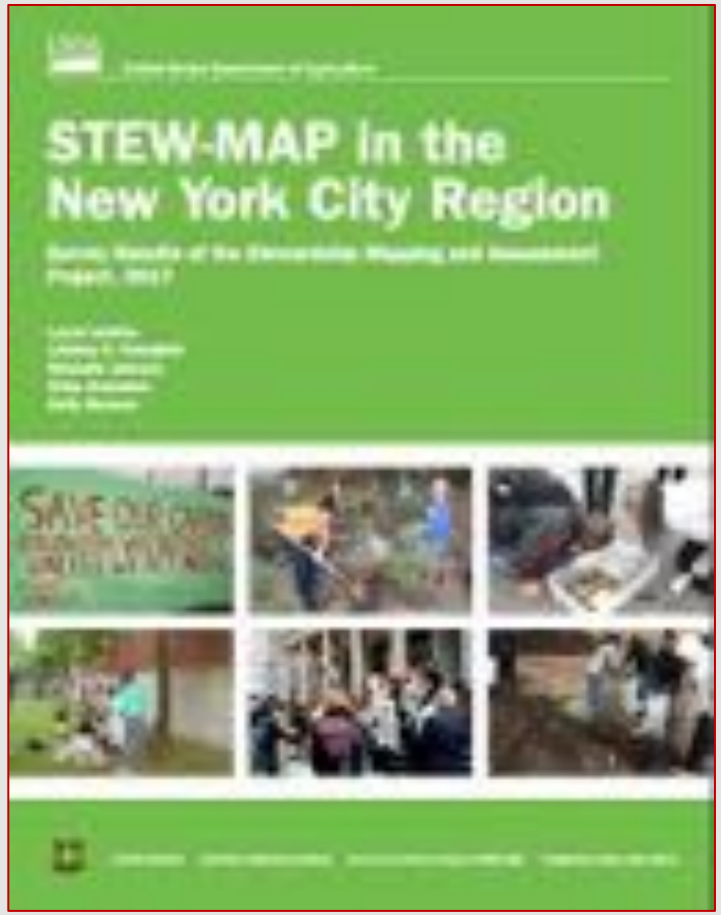
Review the Collecting Data cheat sheet for more information about filling out the Job form.

STEW-MAP

STEWARDSHIP MAPPING & ASSESSMENT PROJECT

- The Stewardship Mapping and Assessment Project (STEW-MAP) is a research methodology, community organizing approach, and partnership mapping tool developed by scientists at the USDA Forest Service Northern Research station

- Identify the gaps and overlaps in stewardship to build community capacity and strengthen the system.

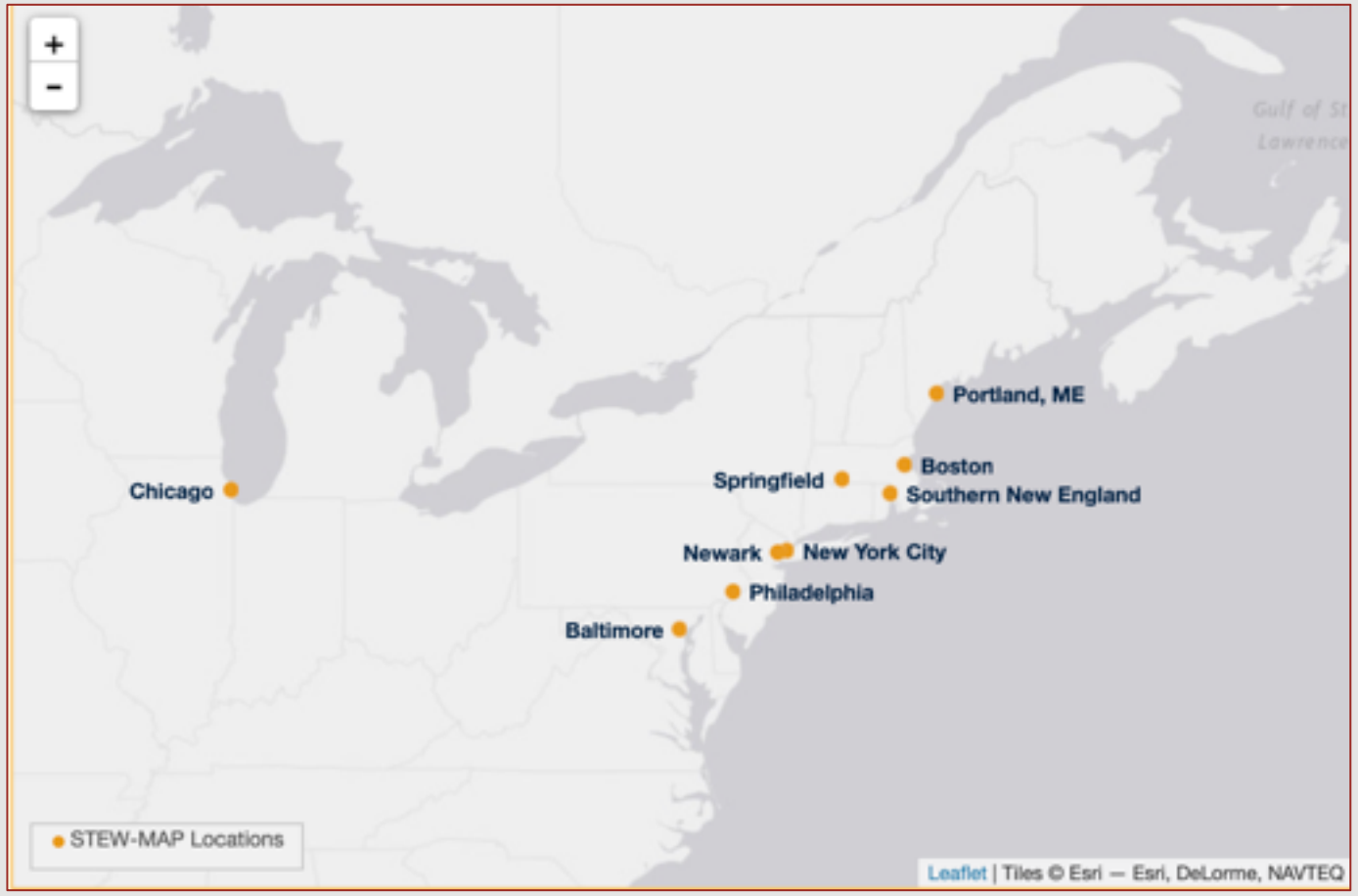


STEW-MAP

STEWARDSHIP MAPPING & ASSESSMENT PROJECT

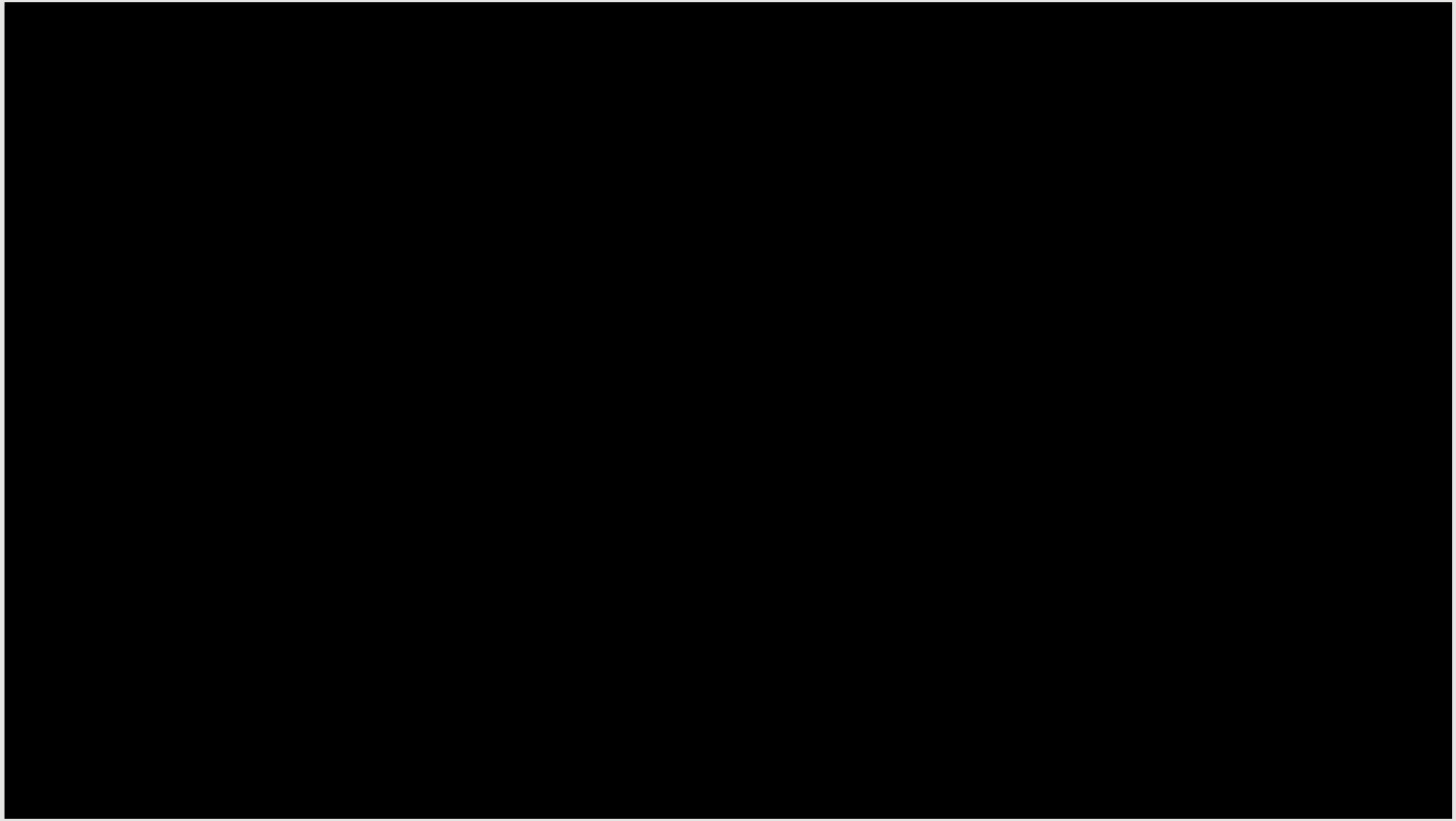
- Who Takes Care of the Environment?
- Understanding the structure and function of stewardship groups across a landscape is a powerful step in leveraging stewardship capacity

STEW-MAP


Portland, ME
Boston
Springfield
Chicago
Southern New England
Newark
New York City
Philadelphia
Baltimore
STEW-MAP Locations
Leaflet | Tiles © Esri — Esri, DeLorme, NAVTEQ

STEW-MAP Springfield

Get on the Map Today!



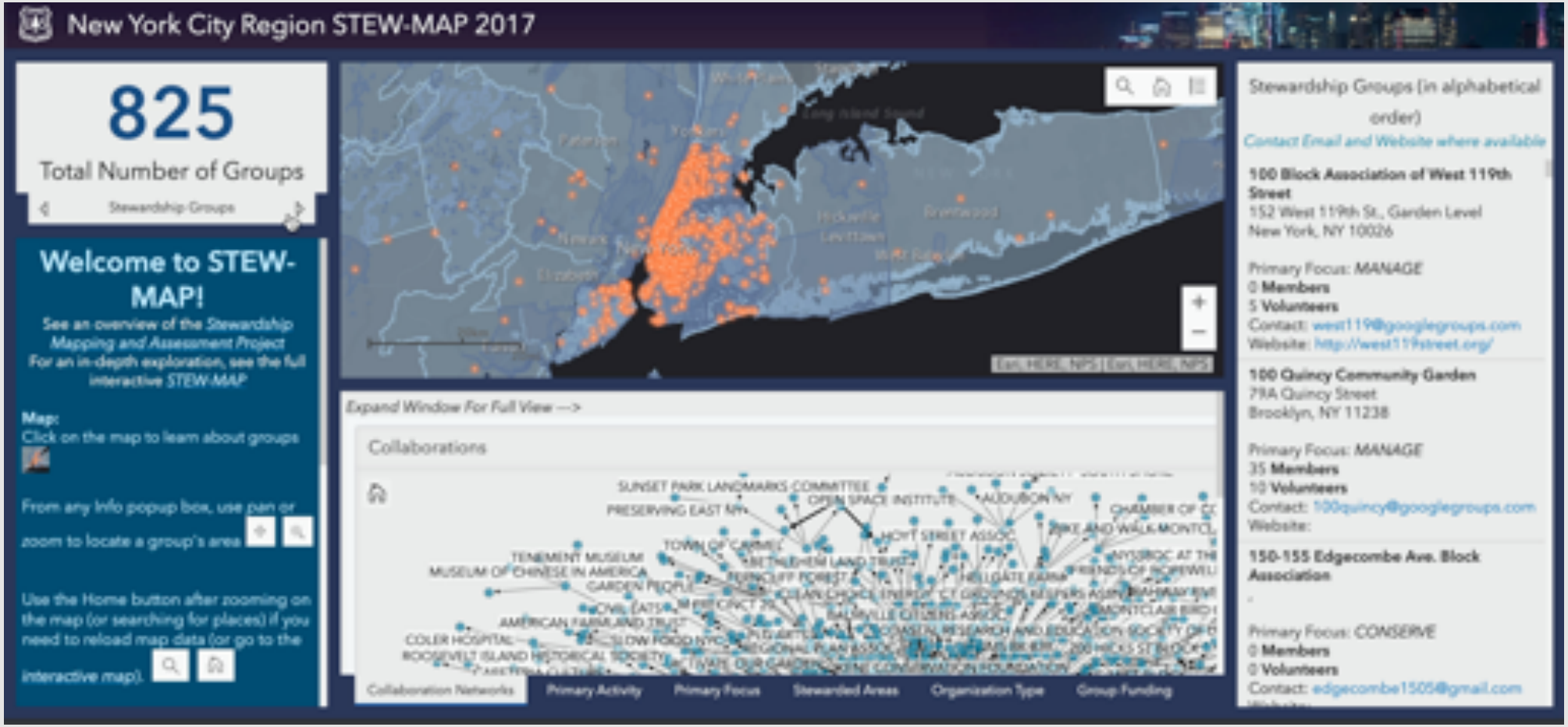
University of Massachusetts Amherst BE REVOLUTIONARY

STEW-MAP

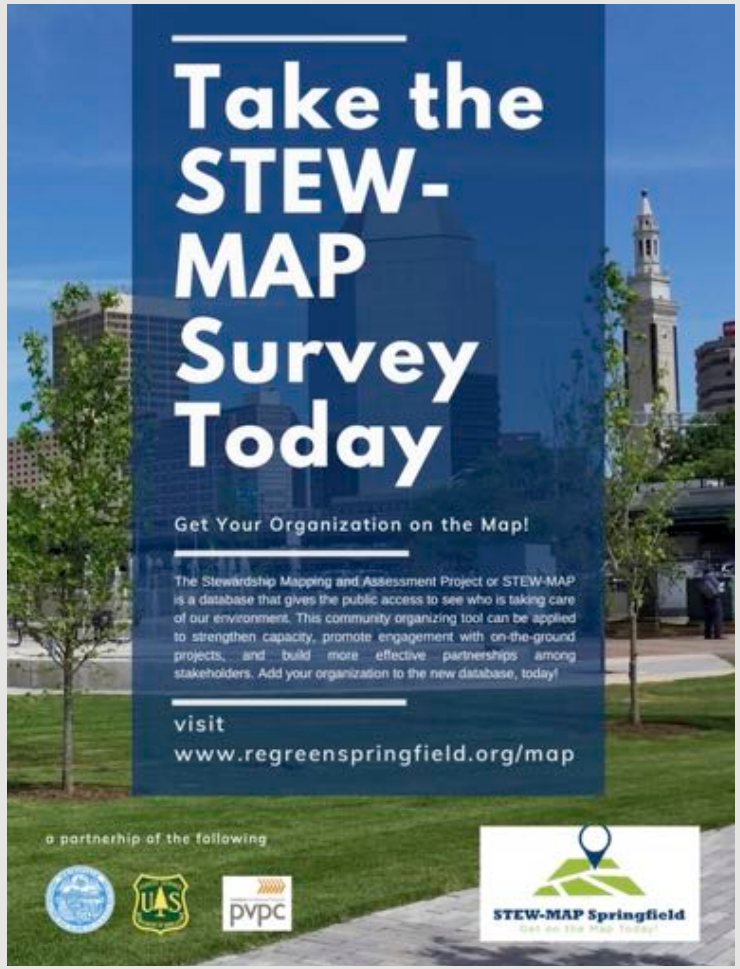
STEWARDSHIP MAPPING & ASSESSMENT PROJECT

STEW-MAP

STEWARDSHIP MAPPING & ASSESSMENT PROJECT

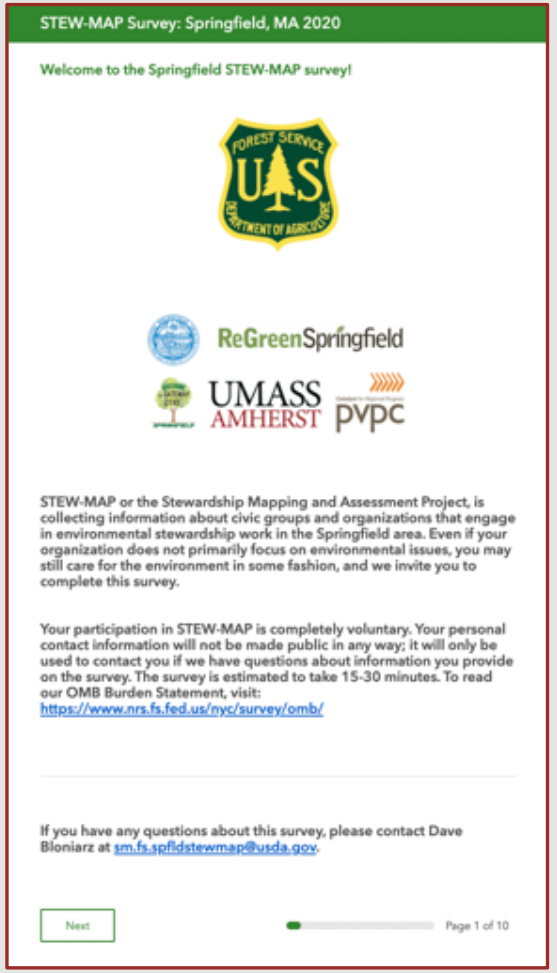


STEW-MAP SPRINGFIELD



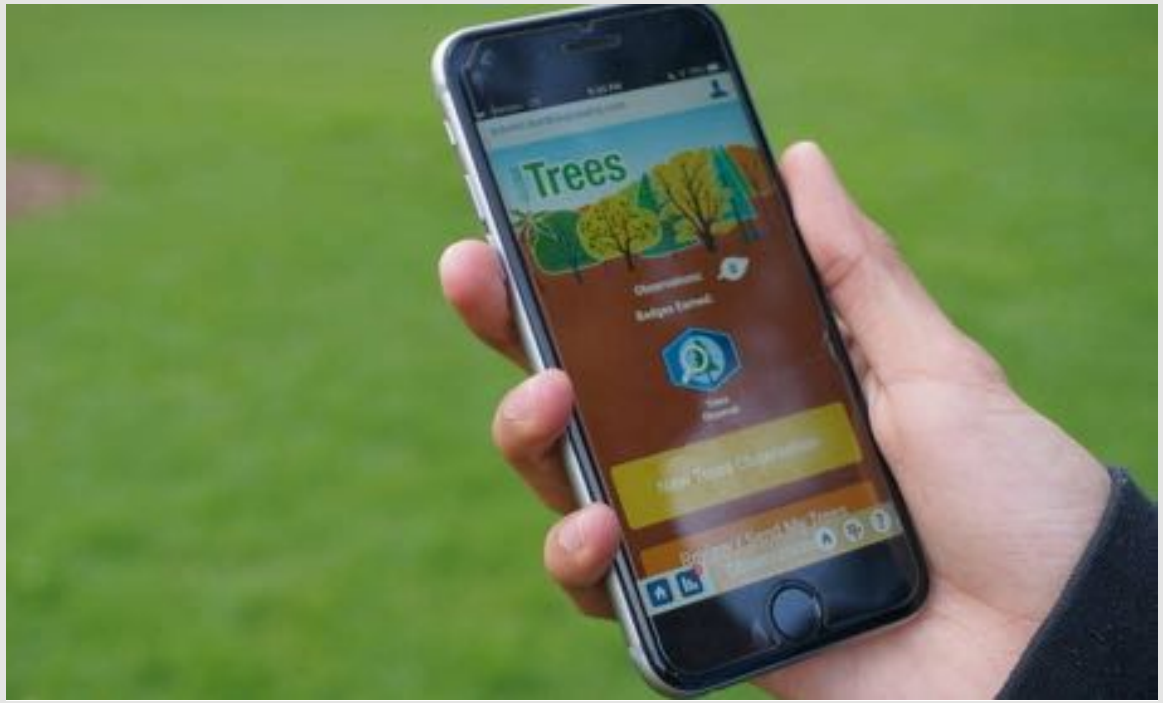
STEW-MAP SPRINGFIELD

- Online Survey
- Greenspace users, stewards and supporters
- Interest areas, activities, membership and social media connections



NASA'S GLOBE OBSERVER CITIZEN-SCIENCE

- Healthy forests are important to Earth's ecosystem
- NASA satellites and airborne missions study forests to see how carbon moves
- Citizen scientists can help by using their phone to measure components of their local landscapes.



NASA'S GLOBE OBSERVER

- Simple, easy to use interface.
- Well suited to classroom, community engagement and science-based studies.
- Examine trees, clouds, land-use and other ecosystem components.

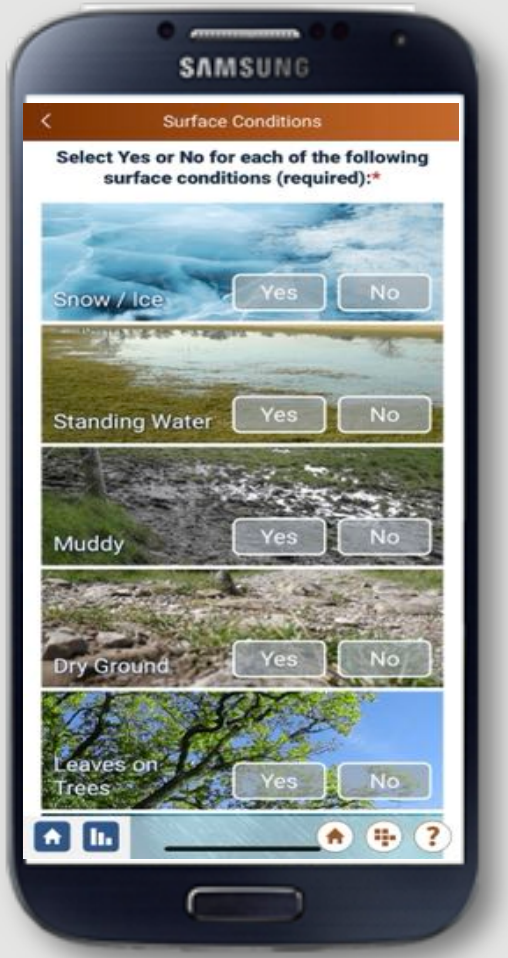
GLOBE OBSERVER TREES

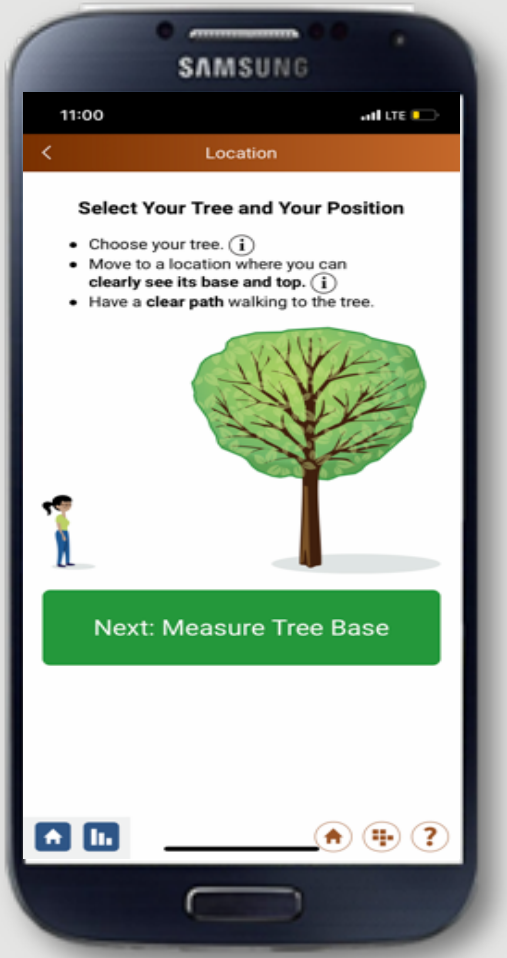
- A citizen science app allowing volunteers to take observations
- GLOBE Trees a feature of the app
- The tree-height project is the latest in a suite of tools that people can use to study their surroundings
- Tree height measurements help with NASA missions like the Ice

GLOBE OBSERVER TREES

- The Trees tool in the GLOBE Observer app allows Citizen Scientist observers to use their mobile devices to take tree height and tree circumference measurements all over the globe.

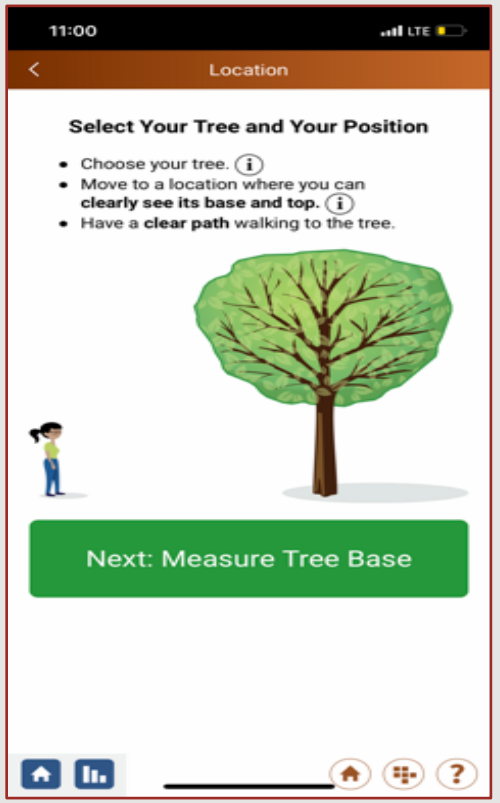
EXAMPLE: TREE COVER





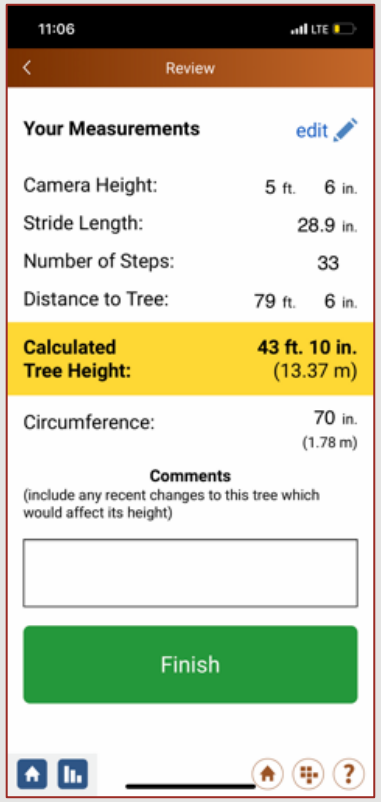
EXAMPLE: TREE COVER

- Stand where you can see top and bottom of tree
- Have your phone eye level and follow the on-screen instructions about measuring the tree
  - Includes aligning pictures of base and top of tree
- Finish by taking a picture of the entire tree



EXAMPLE: TREE COVER

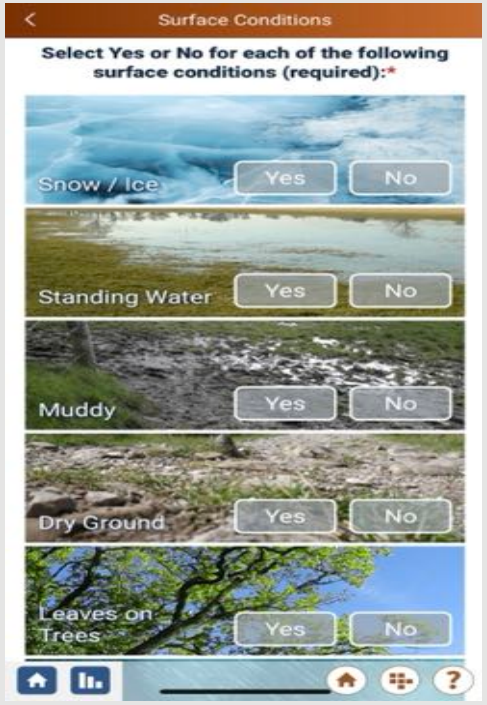
- Walk to the base of the tree while counting your steps using your natural stride (decimals allowed)
- Optional to measure circumference
- See your recorded data and send to the GLOBE!



GLOBE OBSERVER LAND COVER

- The land cover tool allows to record the vegetation and terrain around them
- Report on current surface conditions, then take photographs in all four cardinal directions along with up and down
- Classify the land cover in your photographs, telling us if it is grassland, a forest or an urban area

EXAMPLE: LAND COVER



- Find an open space of about 100 yards by 100 yards
- Select your environment's appropriate conditions

EXAMPLE: LAND COVER

- Align phone with up and down directions
- Align with cardinal directions shown on screen
- Rotate your phone horizontally to take a picture

EXAMPLE: LAND COVER

- After pictures are take a general layout of the land is constructed
- See your recorded data and send to the GLOBE!

I-TREE GHG PLANTING CALCULATOR

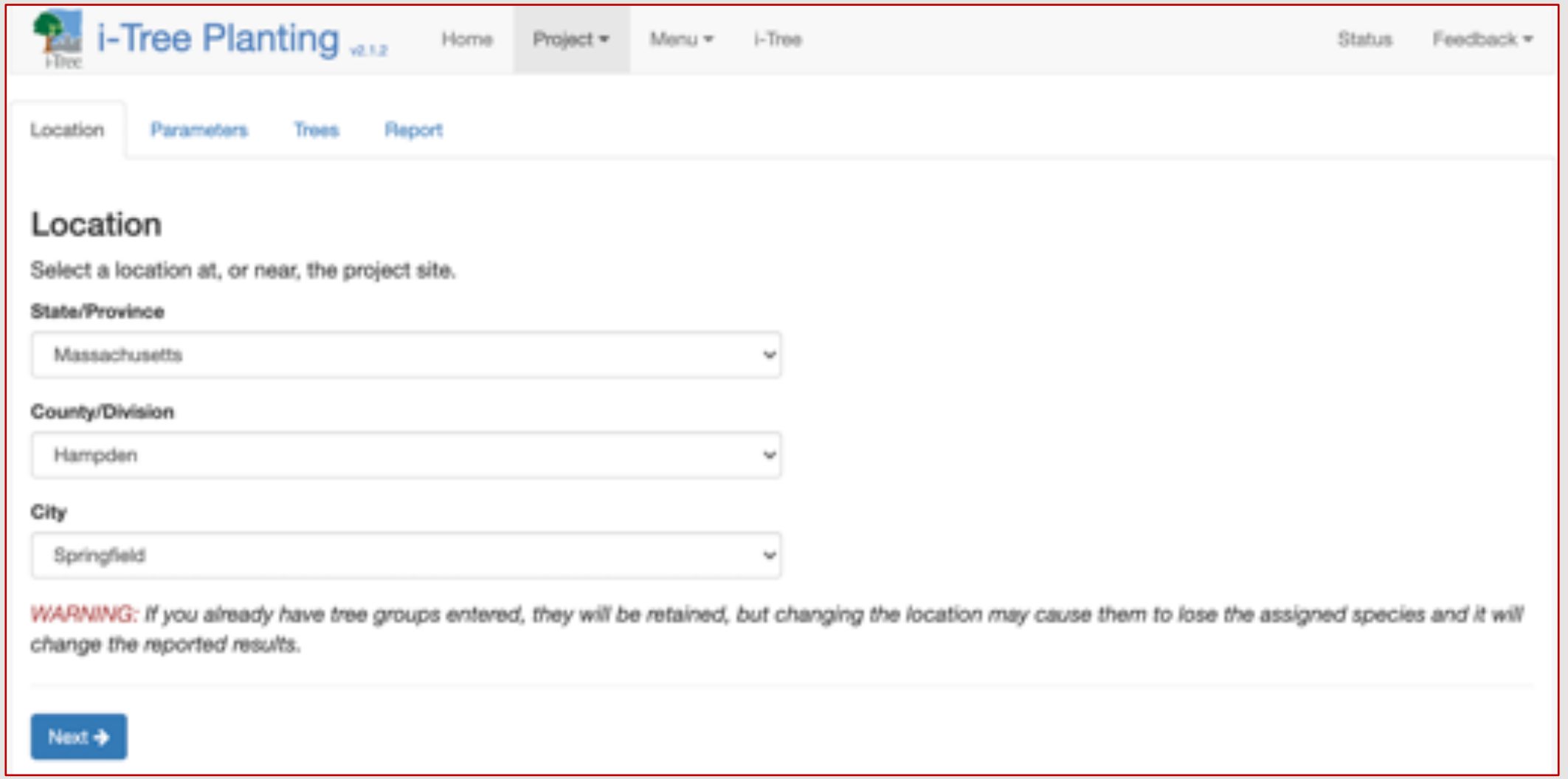
- The i-Tree Planting Calculator is designed to help you estimate the long-term environmental benefits from a tree planting project.
- The focus is on greenhouse gases, but many co-benefits are included.
- Useful for planners, landscape designers, sustainability managers and arborists.

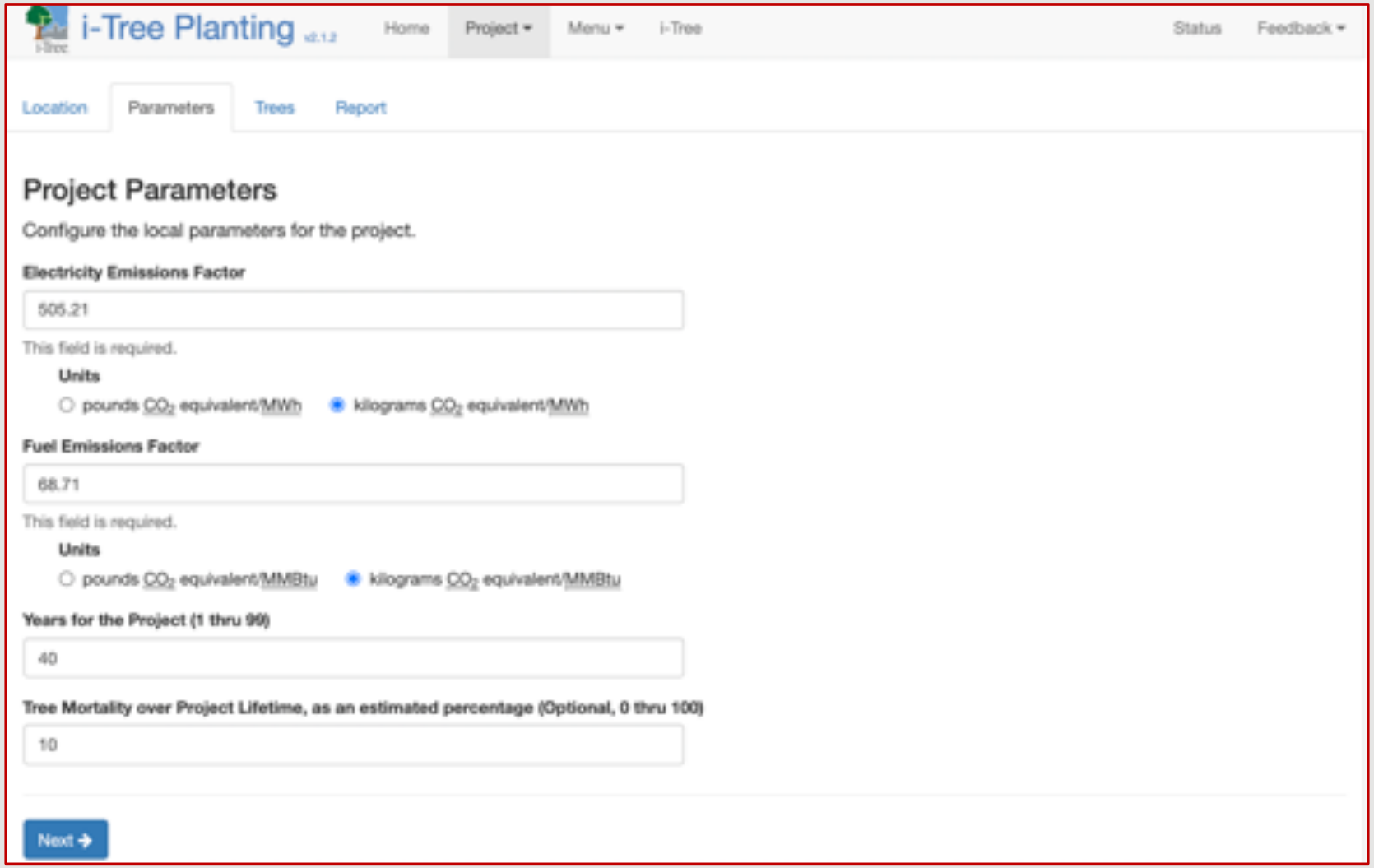
INFORMATION IS CALCULATED FOR THE PROJECT LIFE TIME:
(IN UNITS AND ASSOCIATED DOLLAR VALUES)

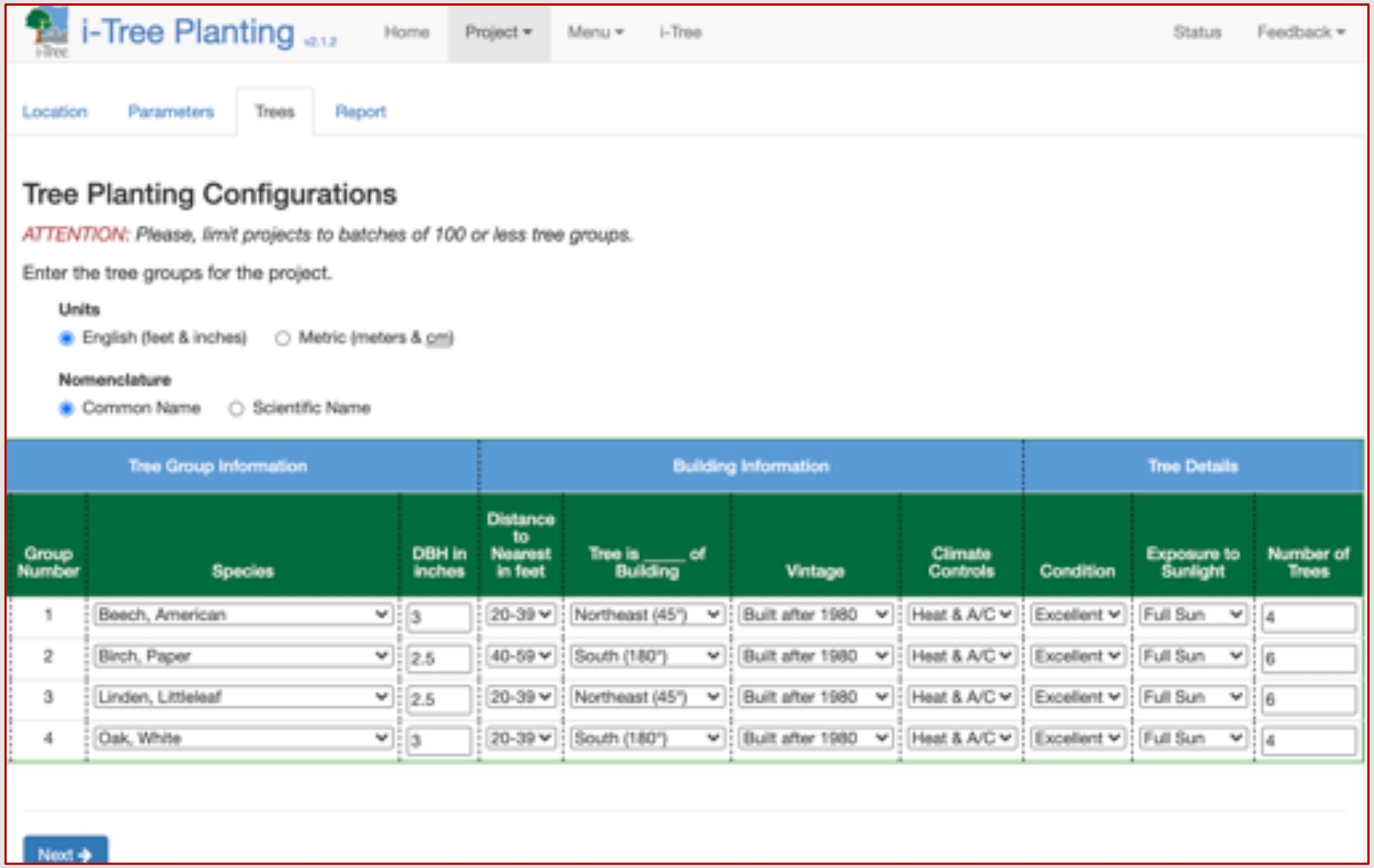
- Greenhouse Gas (GHG) sequestered and avoided (owing to reductions in energy use)
- Energy conserved
- Air pollutants captured and avoided
- Stormwater filtered
- Tree total biomass
- Tree benefits can also be estimated

USERS ENTER THE FOLLOWING INFORMATION:

- Tree species
- Size of trees at planting
- Information on the distance and direction to the nearest building (optional)
- Information about the tree's growing conditions
- Estimated mortality (optional)
- The number of trees with each configuration
- Project lifetime (number of years)
- Specific greenhouse gas values (optional)


i-Tree Planting v2.1.2
Home
Project
Menu
i-Tree
Status
Feedback
Location
Parameters
Trees
Report
Location
Select a location at, or near, the project site.
State/Province
Massachusetts
County/Division
Hampden
City
Springfield
WARNING: If you already have tree groups entered, they will be retained, but changing the location may cause them to lose the assigned species and it will change the reported results.
Next


i-Tree Planting v2.1.2
Home
Project
Menu
i-Tree
Status
Feedback
Location
Parameters
Trees
Report
Project Parameters
Configure the local parameters for the project.
Electricity Emissions Factor
505.21
This field is required.
Units
pounds CO2 equivalent/MWh
kilograms CO2 equivalent/MWh
Fuel Emissions Factor
68.71
This field is required.
Units
pounds CO2 equivalent/MMBtu
kilograms CO2 equivalent/MMBtu
Years for the Project (1 thru 99)
40
Tree Mortality over Project Lifetime, as an estimated percentage (Optional, 0 thru 100)
10
Next


i-Tree Planting v2.1.2
Home
Project
Menu
i-Tree
Status
Feedback
Location
Parameters
Trees
Report
Tree Planting Configurations
ATTENTION: Please, limit projects to batches of 100 or less tree groups.
Enter the tree groups for the project.
Units
English (feet & inches)
Metric (meters & cm)
Nomenclature
Common Name
Scientific Name
Tree Group Information
Building Information
Tree Details
Group Number
Species
DBH in inches
Distance to Nearest in feet
Tree is ____ of Building
Vintage
Climate Controls
Condition
Exposure to Sunlight
Number of Trees
1 Beech, American 3 20-39 Northeast (45°) Built after 1980 Heat & A/C Excellent Full Sun 4
2 Birch, Paper 2.5 40-59 South (180°) Built after 1980 Heat & A/C Excellent Full Sun 6
3 Linden, Littleleaf 2.5 20-39 Northeast (45°) Built after 1980 Heat & A/C Excellent Full Sun 6
4 Oak, White 3 20-39 South (180°) Built after 1980 Heat & A/C Excellent Full Sun 4
Next

Project Report - i-Tree Planting Calculator v2.1.2

Location: Springfield, Massachusetts 01109
Electricity Emissions Factor: 505.21 kilograms CO2 equivalent/MWh
Fuel Emissions Factor: 68.71 kilograms CO2 equivalent/MMBtu
Lifetime: 40 years
Tree Mortality: 10%

All amounts in the tables are for the full lifetime of the project.

Units

(•) English (pounds & tons; kWh & MMBtu; gallons) ( ) Metric (kilograms & metric tons; kWh & MMBtu; cubic meters)

Copy | Export | CO_2 | Energy | Eco | Air Pollution

Search:

Location		CO_2 Benefits			
Group Identifier	Tree Group Characteristics	CO_2 Avoided (pounds)	CO_2 Avoided ($)	CO_2 Sequestered (pounds)	CO_2 Sequestered ($)
1	• (4.0) Beech, American (Fagus grandifolia) at 3.0 inches DBH. • Planted 20-39 feet and northeast (45°) of buildings that were built post-1980 with heat and A/C. • Trees are in excellent condition and planted in full sun.	36,860.5	$857.26	7,227.0	$168.08
2	• (6.0) Birch, Paper (Betula papyrifera) at 2.5 inches DBH. • Planted 40-59 feet and south (180°) of buildings that were built post-1980 with heat and A/C. • Trees are in excellent condition and planted in full sun.	26,603.5	$618.71	33,463.9	$778.27
3	• (6.0) Linden, Littleleaf (Tilia cordata) at 2.5 inches DBH. • Planted 20-39 feet and northeast (45°) of buildings that were built post-1980 with heat and A/C. • Trees are in excellent condition and planted in full sun.	19,917.5	$463.22	10,300.2	$239.55
4	• (4.0) Oak, White (Quercus alba) at 3.0 inches DBH. • Planted 20-39 feet and south (180°) of buildings that were built post-1980 with heat and A/C. • Trees are in excellent condition and planted in full sun.	-561.0	$-13.05	6,125.1	$142.45

Project Report - i-Tree Planting Calculator v2.1.2

Location: Springfield, Massachusetts 01109
Electricity Emissions Factor: 505.21 kilograms CO2 equivalent/MWh
Fuel Emissions Factor: 68.71 kilograms CO2 equivalent/MMBtu
Lifetime: 40 years
Tree Mortality: 10%

All amounts in the tables are for the full lifetime of the project.

Units

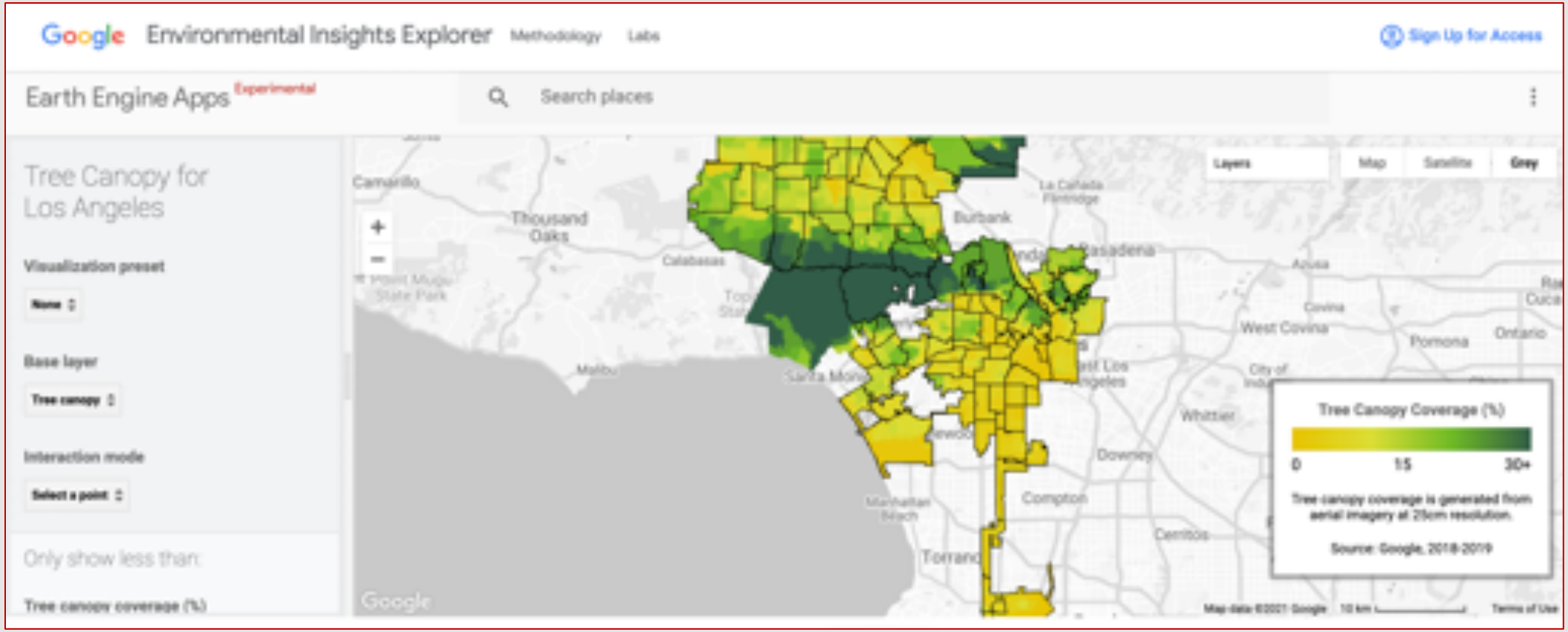
(•) English (pounds & tons; kWh & MMBtu; gallons) ( ) Metric (kilograms & metric tons; kWh & MMBtu; cubic meters)

Copy | Export | CO_2 | Energy | Eco | Air Pollution

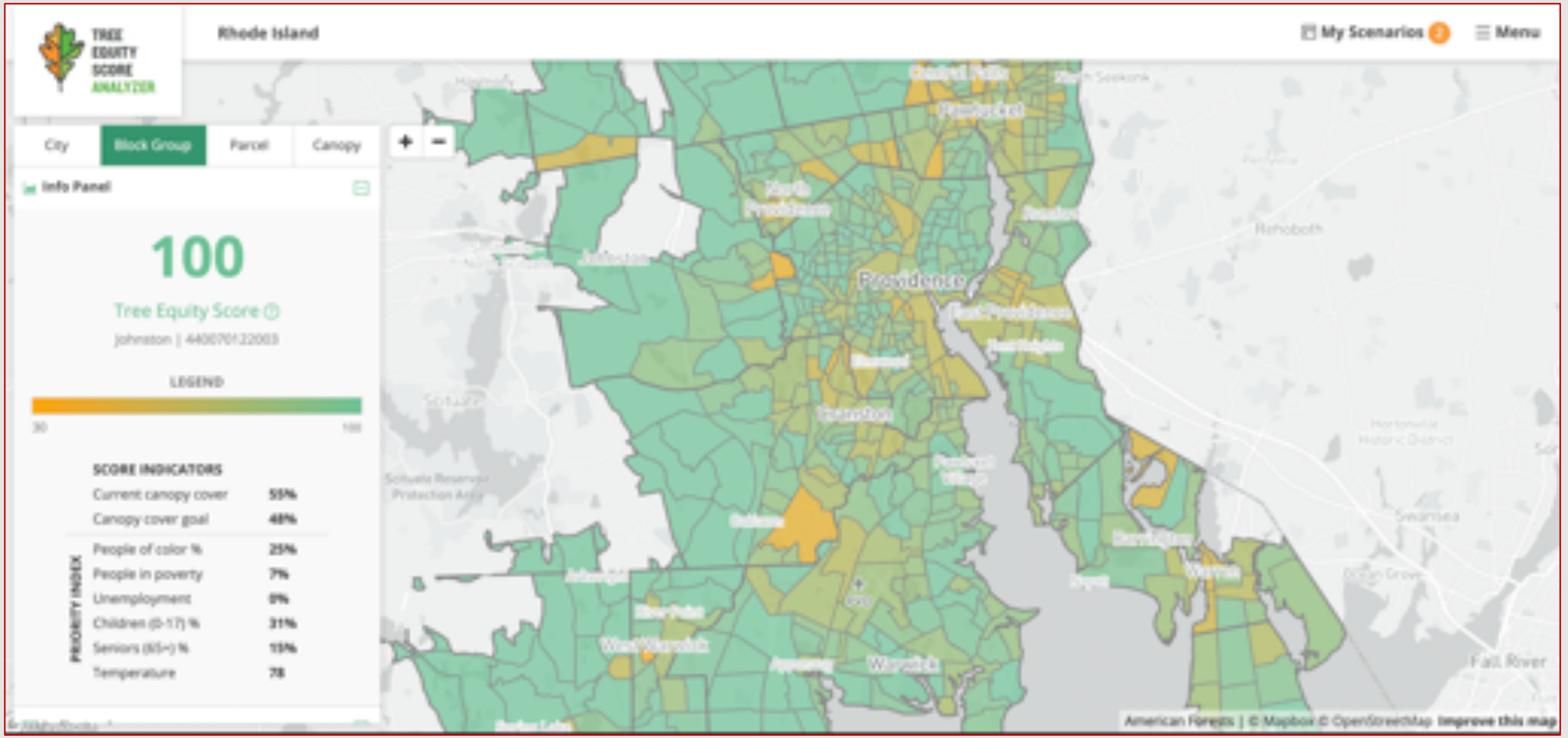
Search:

Location		Air Benefits							
Group Identifier	Tree Group Characteristics	O_3 Removed (pounds)	NO_2 Avoided (pounds)	NO_2 Removed (pounds)	SO_2 Avoided (pounds)	SO_2 Removed (pounds)	VOC Avoided (pounds)	$PM_{2.5}$ Avoided (pounds)	$PM_{2.5}$ Removed (pounds)
1	• (4.0) Beech, American (Fagus grandifolia) at 3.0 inches DBH. • Planted 20-39 feet and northeast (45°) of buildings that were built post-1980 with heat and A/C. • Trees are in excellent condition and planted in full sun.	69.0	5.3	11.8	68.2	2.6	1.2	2.9	3.4
2	• (6.0) Birch, Paper (Betula papyrifera) at 2.5 inches DBH. • Planted 40-59 feet and south (180°) of buildings that were built post-1980 with heat and A/C. • Trees are in excellent condition and planted in full sun.	82.6	3.8	13.3	49.2	3.2	0.8	3.0	2.9
3	• (6.0) Linden, Littleleaf (Tilia cordata) at 2.5 inches DBH. • Planted 20-39 feet and northeast (45°) of buildings that were built post-1980 with heat	59.4	2.9	9.7	36.8	2.3	0.6	1.6	2.3

GOOGLES LABS: TREE CANOPY



AMERICAN FORESTS/US FOREST SERVICE
TREE EQUITY SCORE ANALYZER (TESA)



VIBRANT CITIES LAB URBAN FORESTRY TOOLKIT

Thanks for Your Attention!

DAVID BLONIARZ, US FOREST SERVICE

WWW.UNRI.ORG/RESEARCH-DOCUMENTS

DAVID.BLONIARZ@USDA.GOV

University of Massachusetts Amherst BE REVOLUTIONARY™