i-Tree Open Academy

Summer 2023

Session 2: Tools for Individual Trees

Online with MyTree, i-Tree Planting, and i-Tree Design

August 9, 2023

1:00pm Eastern Time

Davey Institute/USDA Forest Service

i-Tree

i-Tree is a Cooperative Initiative among these partners

DAVEY

Arbor Day Foundation

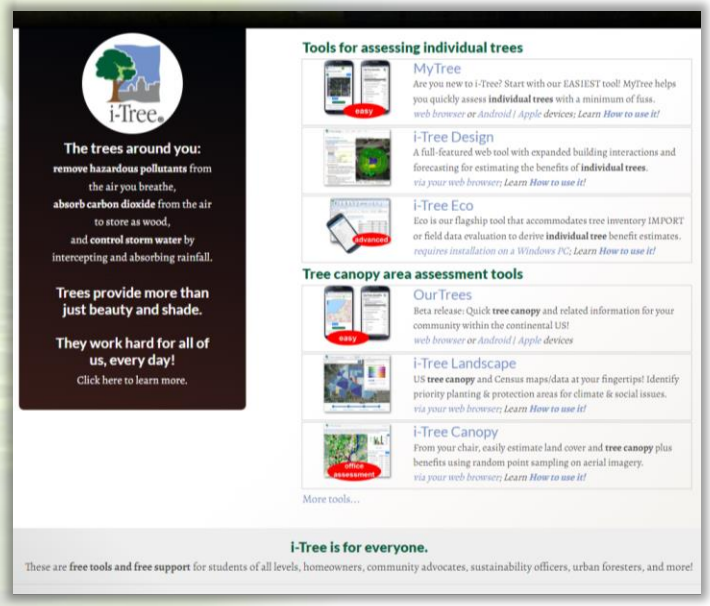
ISA

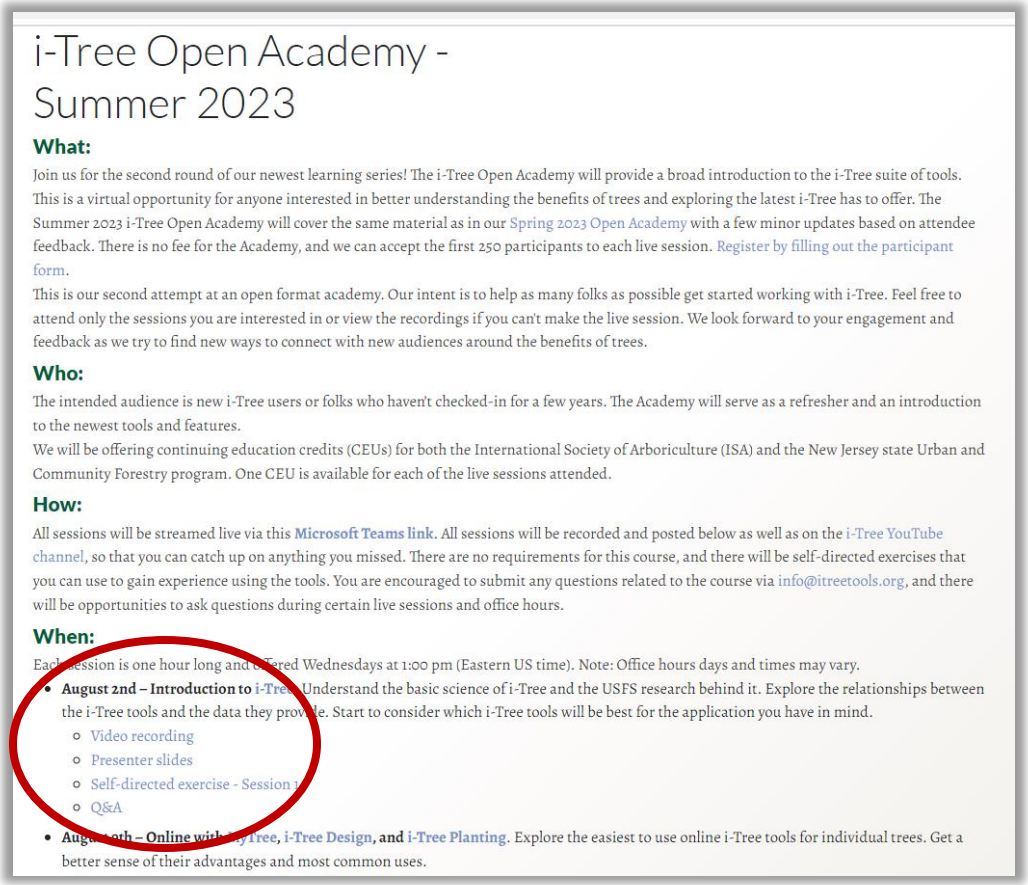
Casey Trees

ESF
State University of New York
College of Environmental Science and Forestry

Accessing the Science of Tree Benefits

- *www.itreetools.org*
- Session 1 now online!
- Exercises available
- Use Chat for questions
- Certificates of completion available after Academy close





i-Tree Open Academy - Summer 2023

What:

Join us for the second round of our newest learning series! The i-Tree Open Academy will provide a broad introduction to the i-Tree suite of tools. This is a virtual opportunity for anyone interested in better understanding the benefits of trees and exploring the latest i-Tree has to offer. The Summer 2023 i-Tree Open Academy will cover the same material as in our Spring 2023 Open Academy with a few minor updates based on attendee feedback. There is no fee for the Academy, and we can accept the first 250 participants to each live session. Register by filling out the participant form.

This is our second attempt at an open format academy. Our intent is to help as many folks as possible get started working with i-Tree. Feel free to attend only the sessions you are interested in or view the recordings if you can't make the live session. We look forward to your engagement and feedback as we try to find new ways to connect with new audiences around the benefits of trees.

Who:

The intended audience is new i-Tree users or folks who haven't checked-in for a few years. The Academy will serve as a refresher and an introduction to the newest tools and features.

We will be offering continuing education credits (CEUs) for both the International Society of Arboriculture (ISA) and the New Jersey state Urban and Community Forestry program. One CEU is available for each of the live sessions attended.

How:

All sessions will be streamed live via this **Microsoft Teams link**. All sessions will be recorded and posted below as well as on the i-Tree YouTube channel, so that you can catch up on anything you missed. There are no requirements for this course, and there will be self-directed exercises that you can use to gain experience using the tools. You are encouraged to submit any questions related to the course via info@itreetools.org, and there will be opportunities to ask questions during certain live sessions and office hours.

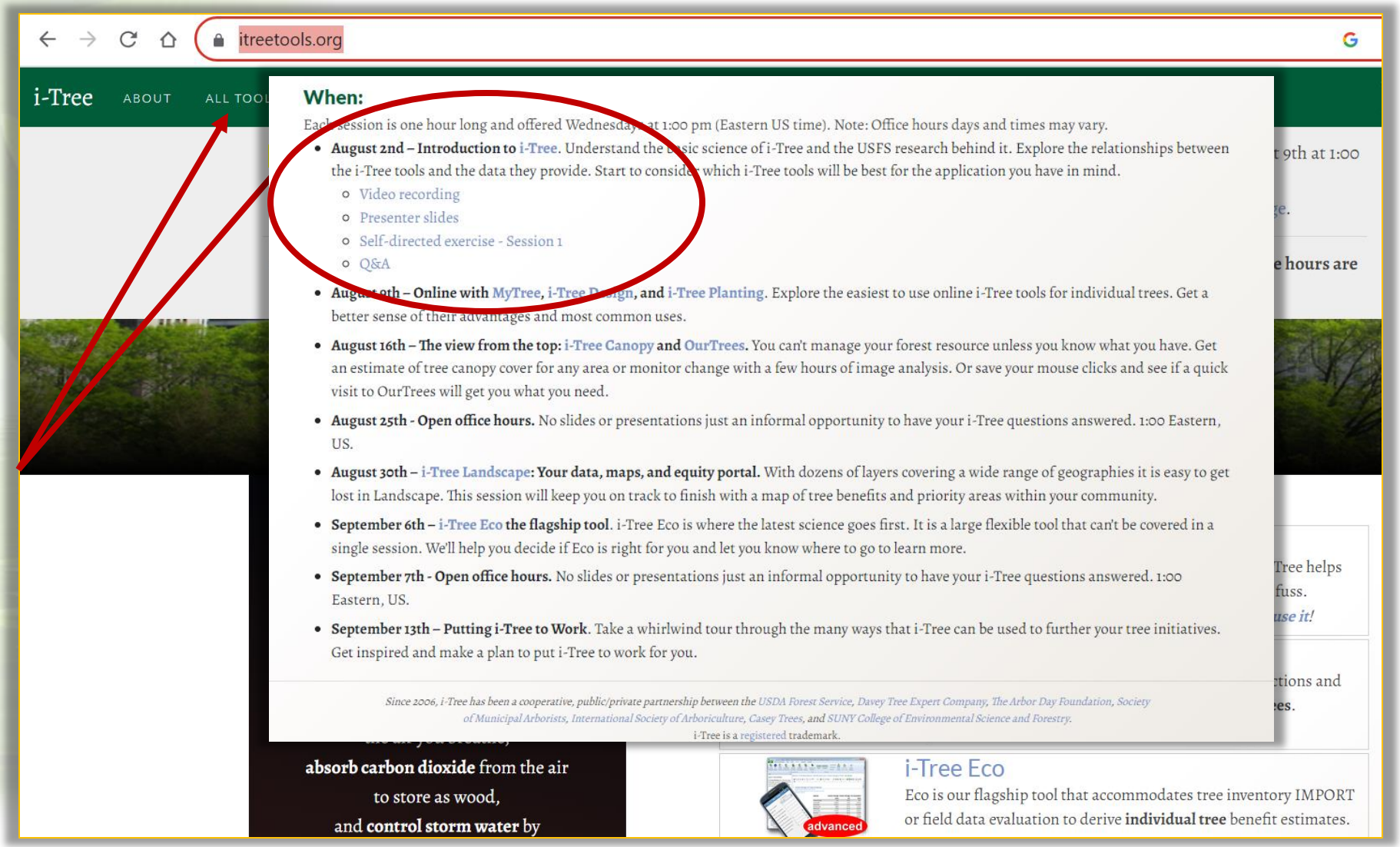
When:

Each session is one hour long and offered Wednesdays at 1:00 pm (Eastern US time). Note: Office hours days and times may vary.

- **August 2nd – Introduction to i-Tree.** Understand the basic science of i-Tree and the USFS research behind it. Explore the relationships between the i-Tree tools and the data they provide. Start to consider which i-Tree tools will be best for the application you have in mind.
  - Video recording
  - Presenter slides
  - Self-directed exercise - Session 1
  - Q&A
- **August 30th – Online with MyTree, i-Tree Design, and i-Tree Planting.** Explore the easiest to use online i-Tree tools for individual trees. Get a better sense of their advantages and most common uses.

i-Tree Website Resources

- www.itreetools.org
- Access to all tools
- Methodologies and How-To Resources
- See projects that use i-Tree and learn how to get help



Support

i-Tree helps people understand the benefits that trees provide and our support t
free support in using the tools, understanding the science (and pointing the way
training.

Overview he support we p
For new users, here is a handy

Learn to use the i-Tre

- Video learning
- Manuals, Guides, and Wo
  - Project Planning and
- Teaching

i-Tree Academy and Learni

- i-Tree Open Academy Su
- i-Tree Open Academy Spr
  watching and reviewing t
- i-Tree for Funding Oppor
  Urban and Community F
  8th and 10th. All sessions
- About the Domestic i-Tre
  - Capstone Project Rep

Understand the scien

- Understanding i
  future goals, and opportu
  leader with the USDA For
  - US Forest Service we
    (2021).
- Addtional Methods Docu
- Software and Science cha

Support Overvie

There are several options for seeking help with
including:

- i-Tree System Requirements for Installing
- Video Learning
- i-Tree Manuals, Guides, and Workbooks
- International Use of i-Tree

Individuals interested in using i-Tree applicat
Notes section of the website and refer to do

Reporting Technical Problem

If you are having a problem with an i-Tree app
team for assistance:

- i-Tree application and version that you ar
- Computer and system information such a
- A description of the problem encountered
- Screen captures (Ctrl + Print screen) and e
- We may ask you to send us a copy of your

International Technical Support

The expansion of i-Tree application use intern
resolve international technical support questi
application function and challenges of adaptin
technical support and suggest additional reso

Feedback Page

The i-Tree Feedback Page is a quick webform
about your projects.

User Forum

The i-Tree User Forum is a moderated discussi
communicate experiences and view frequently
Forum requires registration, which is separate
New Forum registrations require administrat
account is not activated, you can still access an

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i-Tree Tools Resource Guide

This guide is intended to help new and experienced users to find the tools, guides, and other resources on the i-Tree Website that you need to help make your project a success.

Find the tools

The core tools are all available directly on the homepage www.itreetools.org. This includes the tree assessment tools, MyTree and i-Tree Design as well as the canopy assessment tools i-Tree Canopy and i-Tree Landscape. Beyond these web-based tools, you can also learn more about i-Tree Eco from the homepage or head directly to the downloads page to request your download link. For additional tools like i-Tree Species and i-Tree Planting visit the All Tools page.

Learn to use the tools (for most of the web-based tools go to Menu>Help to find the "How to use" guide)

Video walkthroughs – Start by checking our learning videos to see if we have any videos to help you get started or complete specific tasks. You can also head to our YouTube channel for even more videos, including recorded webinars and presentations.

Manuals, Guides, and Workbooks – This page includes manuals for individual tools along with guides and workbooks to help you complete specific tasks like post-stratifying your i-Tree Eco project or looking up synonym species in the i-Tree database. Similar documentation in other languages can be found here.

Teaching with the tools – We have a collection of curricula and teaching resources created by the i-Tree team and others.

See how others have used the tools

User's reports – Reports shared with the i-Tree team from a variety of different applications of the i-Tree tools. Additional international reports in a variety of languages can be found here.

Project profiles – For selected user's projects we have a deeper dive into how the project was used to change community perceptions and/or influence management strategies.

Understand the science of i-Tree

Understanding i-Tree – This document is the starting point for all explorations of the science underlying the i-Tree models and estimates. It provides summary descriptions of all model workings and links to peer reviewed publications for additional details.

Methods documentation – A collection of many of the publications, white papers, and data sources representing the science of i-Tree, broken down by tool and topic.

Software and Science change logs – The i-Tree tools are continually updated with the latest research. Sometimes, the software is updated before the documentation can be added to the website. Check out the software and science change logs for the latest changes.

For international i-Tree users

International use – Find information about the use of i-Tree outside the US. You can also find reports shared by international users and available translated documentation linked at the bottom of that page.

Get support

Email us – If you can't find the answers to your questions on the i-Tree website you can always reach our support team by emailing info@itreetools.org.

Feedback form – Use the feedback form if you have suggestions on how to improve the tools or if you would like to share your own project on the i-Tree website.

User's Forum and FAQs – If you have a question others could benefit from, or you think you may have stumbled across a common problem, feel free to post to or search the forum.

4/29/22

info@itreetools.org

Understanding i-Tree

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

	DERIVED VARIABLES		ECOSYSTEM SERVICES											
DIRECT MEASURES				ration	tion									
Species														
Diameter at breast he (d.b.h.)														
Total height														
Crown base height														
Crown width														
Crown light exposure														
Percent crown missin														
Crown health (condit dieback)														
Field land use														
Distance to building														
Direction to building														
Percent tree cover														
Percent shrub cover														
Percent building cove														
Ground cover composition							I					D		

METHODS, ADVANTAGES, AND LIMITATIONS

The premise behind i-Tree is shown in Figure 11. Structure is the basic information on the physical forest resource (e.g., number of trees, species composition, tree sizes and locations, leaf area, etc.). The attributes are directly measured by users or estimated (e.g., leaf area) by i-Tree based on direct measures of structure. From the structure data, along with local environmental data (e.g., weather data), various tree functions (e.g., gas exchange, tree growth) are estimated. These functions are then converted to various services (e.g., pollution removal) based on other local data (e.g., pollution concentrations). These services are then converted to benefits (e.g., cleaner air, impacts on human health) based on other data (e.g., local atmospheric conditions, human population data). Finally, the benefits are converted to values based on various economic procedures.

Forest management objectives often seek to improve environmental or human health, or the value of the forests. Forest managers do not directly manage functions or values, rather they manage forest structure (i.e., plant and remove trees, protect existing forests, and select species and locations) to optimize services and values. However, managers are not the only force influencing forest structure. The existing forest and the environment have a substantial influence on forest structure through natural regeneration, tree growth and mortality, storms, insects and diseases, invasive plants, and other factors. Included in this environmental influence are unintended consequences of human actions and development (e.g., introduction of exotic plants, insects and diseases, increased air temperatures and pollution, climate change, etc.). People and nature act to alter forest structure and consequently forest services and values.

Figure 11.—Diagram showing basic i-Tree process.

i-Tree on YouTube

info@itreetools.org

Video Learning

Explore instructional videos to learn more about the i-Tree applications.
You can also learn about new i-Tree video learning opportunities by subscribing to the i-Tree Tools channel on YouTube!

i-Tree Tools YouTube Page

i-Tree Introduction Series Videos

This (4) part video series was developed to introduce i-Tree to Master Gardeners, volunteers or anyone interested in learning how to use i-Tree for community projects. *(Note these videos refer to older versions of i-Tree applications)*

1. i-Tree Suite & tree benefit introduction - 16 min. - This presentation introduces the i-Tree suite of tools and community tree benefit concepts.
2. i-Tree Design intro and walkthrough - 30 min. - This video demonstrates Design and provides examples of how Design can be used for various community projects.
3. i-Tree Canopy intro and walkthrough - 22 min. - This video explores i-Tree Canopy's capability to estimate canopy cover and associated tree benefits.

i-Tree Download and Basic Desktop Installation

1. Steps for downloading and installing i-Tree desktop software - 13 min ***Updated Nov2020.*** - This was developed for Eco v6 use and includes system requirements overview.
2. Registration, software download and desktop installation - 13 min. - This is an older screencast for workshop participants demonstrating registration, software download and installation steps.
3. Options for installing and running i-Tree on a Mac computer - 4 min.- This video discusses non-supported options such as using Bootcamp or Parallels to run the Windows-based i-Tree software on a Mac computer.

i-Tree Tool Videos

i-Tree Eco v6

Eco Basics, Project Creation and External Import Steps

1. Eco v6 highlights and overview - 5 min. - video highlights features and options in the i-Tree Eco v6 application.
2. Importing external inventory data into Eco v6 - 8 min. - Instructions for setting up an Eco v6 inventory project and importing in external data.
3. Eco v6 sample project creation - 8 min. - Creating a plot-based sample project using the i-Tree Eco v6 application.
4. Eco v6 complete inventory project creation - 11 min. - Creating a complete inventory project using the i-Tree Eco v6 application.
5. Converting Ecov5 to v6 project - 6 min. - How to update an existing Eco v5 legacy project to use in Eco v6.

i-Tree Design

Demonstrate the Value of Trees

Krista Heinlen
Davey Institute/USDA Forest Service

i-Tree

i-Tree is a Cooperative Initiative among these partners

DAVEY

Arbor Day Foundation

sma

ISA

Casey Trees

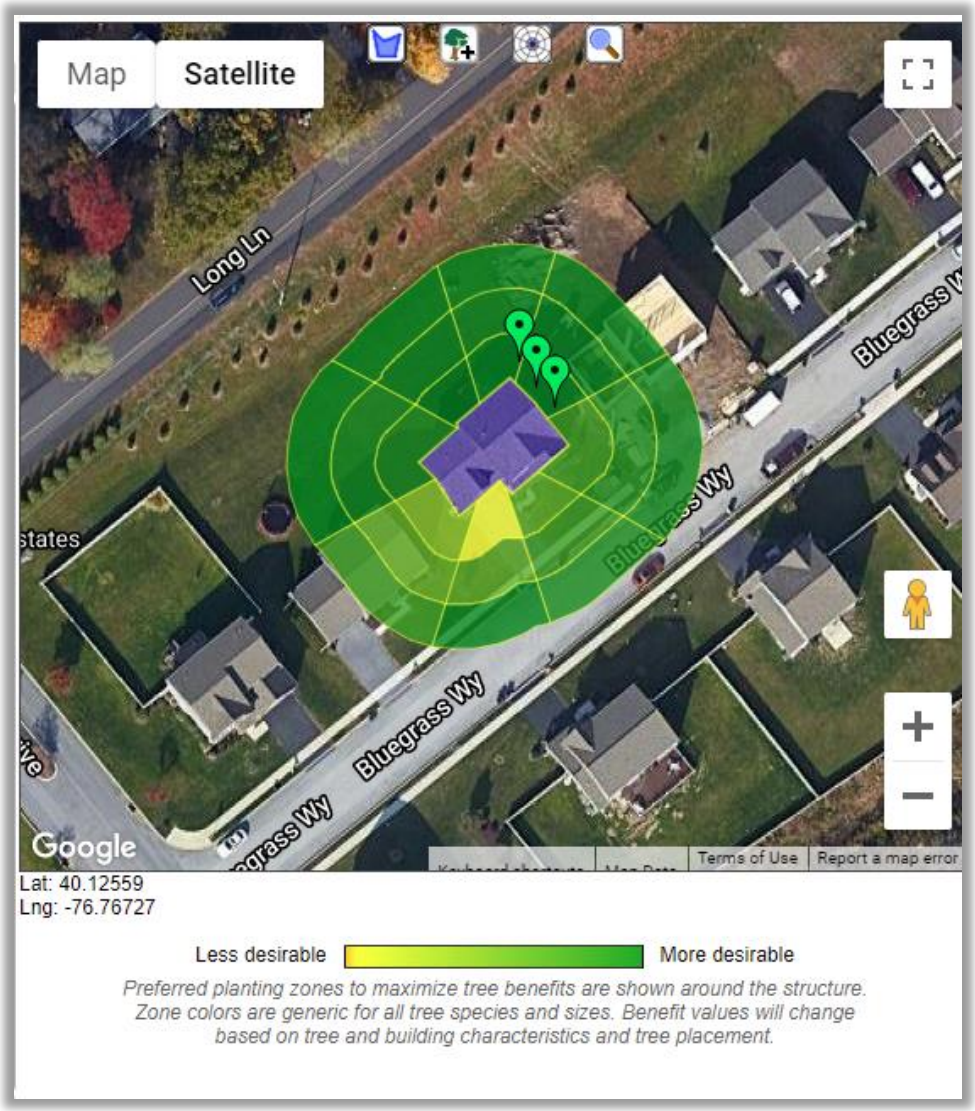
ESF
State University of New York
College of Environmental Science and Forestry

i-Tree Design

Features -

- Accessible online
- Easy to use, easy to edit
- Estimates current year, benefits-to-date, and future benefits
- Printable report summary

Considerations *– Limited to smaller scale projects, benefits processing can be …slow, can not export tree data*



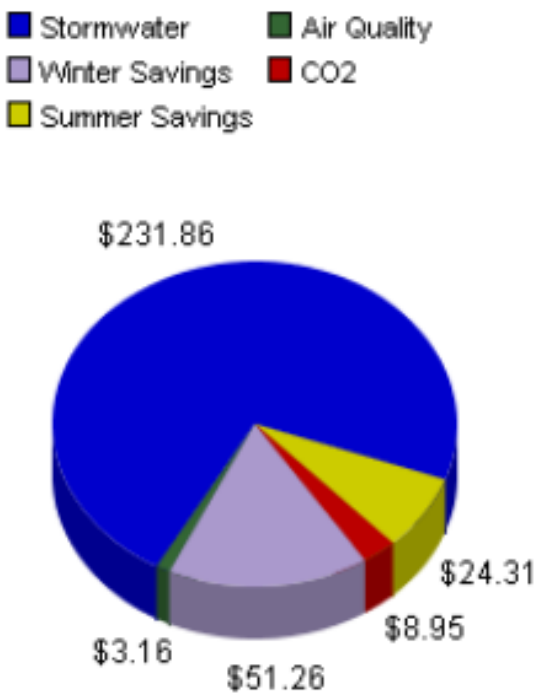
i-Tree Design v7.0 considerations

- Can be used on a tablet…but test it first
- Reports can be printed or you can save and email a PDF document
- Project saving and sharing is possible

Crown Growth Modeler

Provides Quantities and $ Value of Tree Benefits

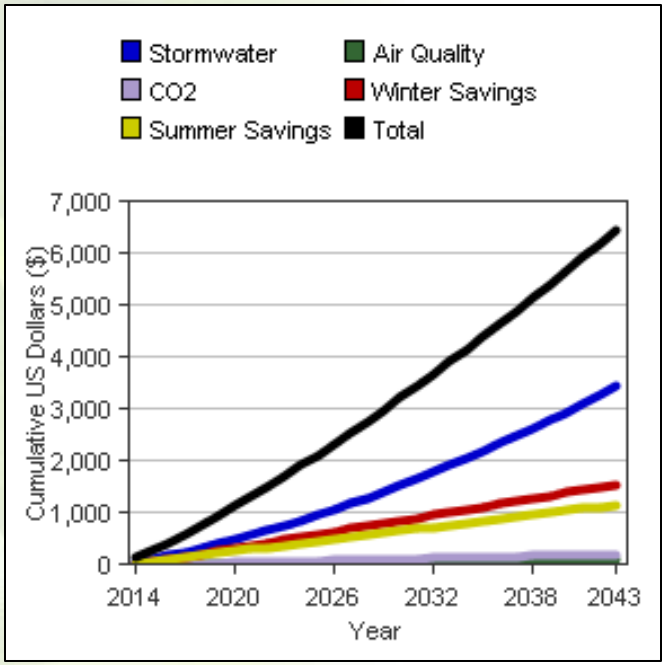
- Estimates 4 core ecosystem services -
  - CO_2 reduction
  - Air pollution removal
  - Stormwater interception & avoided runoff
  - Heating and cooling energy effects when trees are near buildings



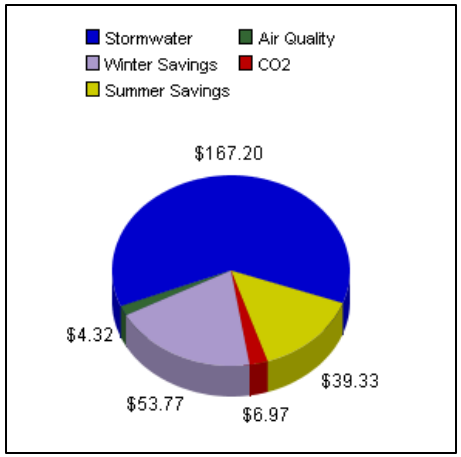
Breakdown of tree benefits

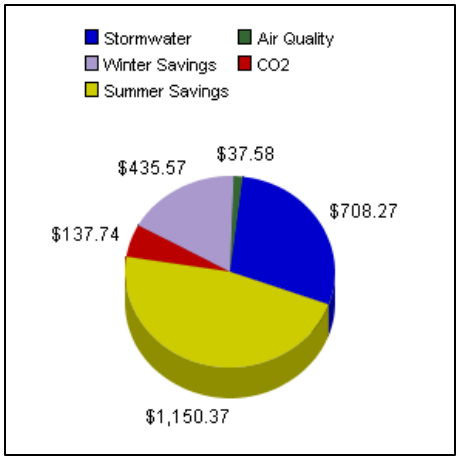
design.itreetools.org

Shows Trees Are an Investment



$6,476 worth of benefits over the next 30 years …and growing





Benefits in 2044 = **$272**

To date = **$2,470**

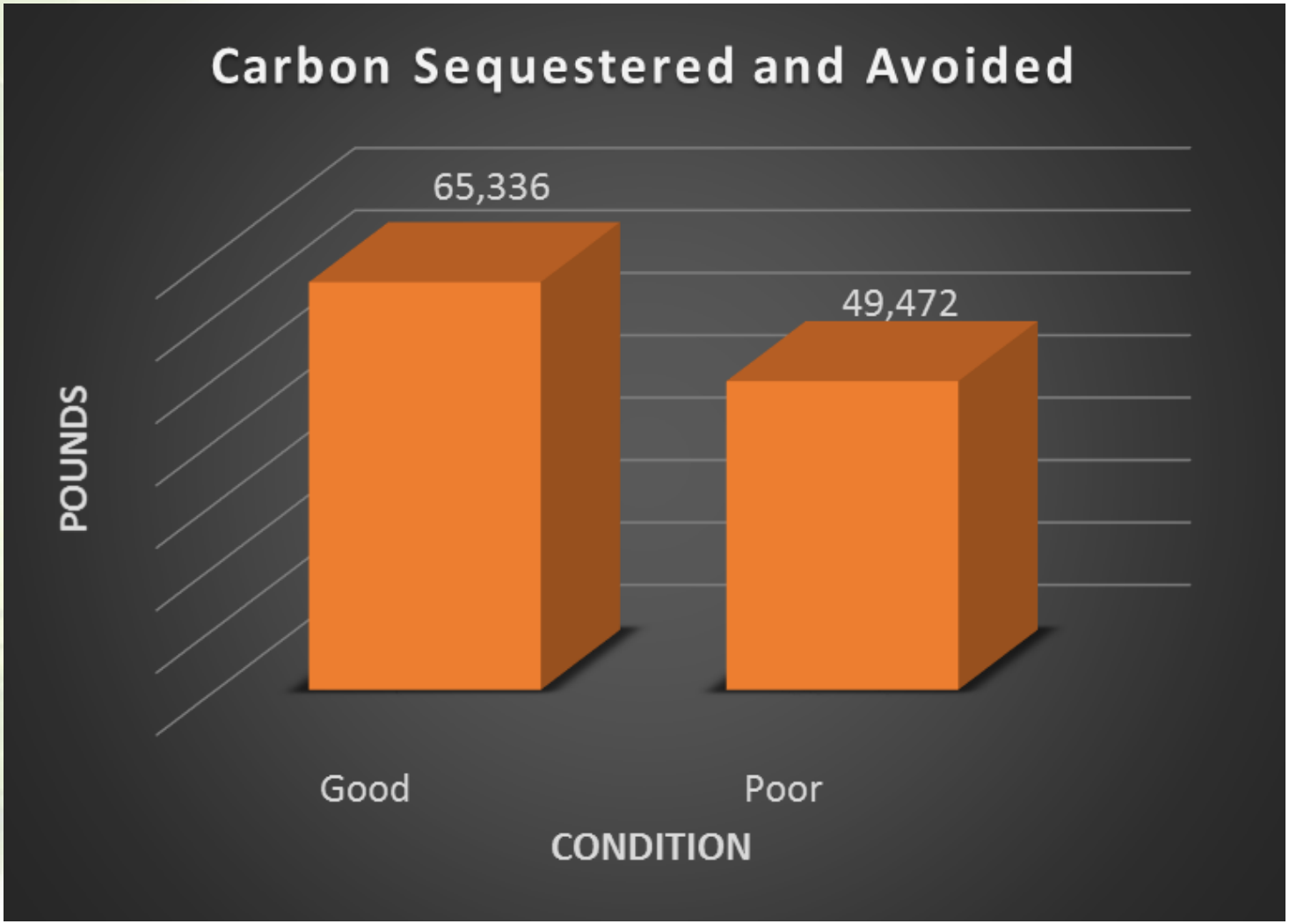
Advocate for Tree Care

- Highlight gems, suggestions for overall health and diversity

DAVEY
Arbor Day Foundation
sma SOCIETY OF MUNICIPAL ARBORISTS
ISA
Casey Trees WASHINGTON DC

Advocate for Tree Care

- Reduce risk
- Increase benefits



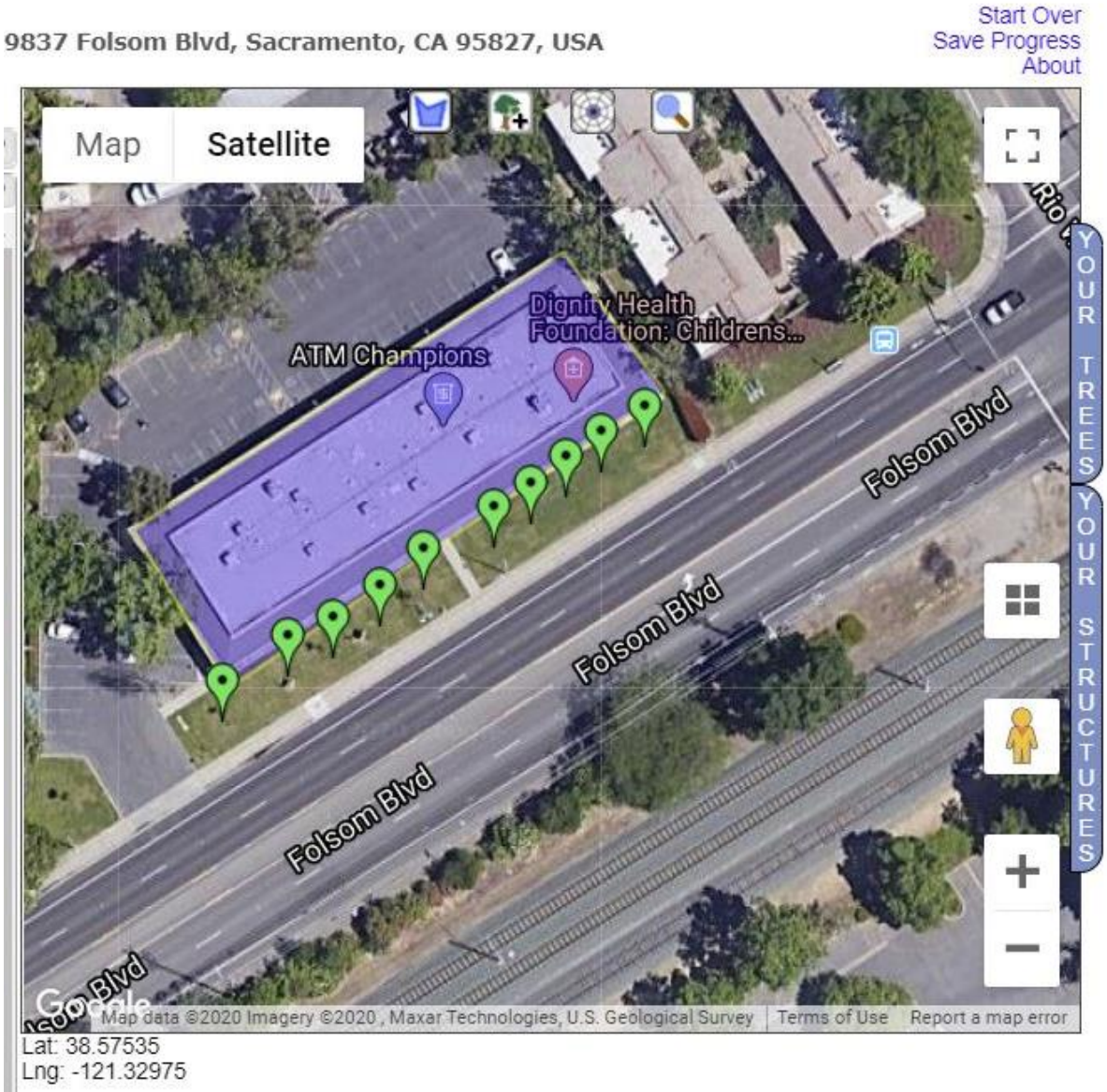
Engage Residential and Small Commercial Property Owners

Existing Trees

- My trees have value?

Proposed Trees

- Where to plant
- Species selection



Report Features: relatable examples

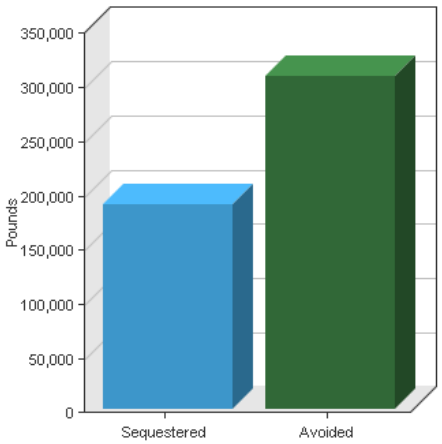
Start Over
Return to Setup
View Report
Print
Save Result
About

i-Tree Design v7.0 York Haven, PA 17370, USA

Display results for: All Trees

Overall Benefits | Stormwater | Energy | Air Quality | Carbon Dioxide

Current Year (2022) | Future Year (2062) | Total (2022-2062) | Total to Date



Over the next 40 years, these trees will reduce atmospheric carbon dioxide (CO_2) by a total amount of 497,045 pounds.

How significant is this number? Most car owners of an "average" car (mid-sized sedan) drive 12,000 miles (19,312 kilometers) generating about 11,000 pounds (4,990 kilograms) of carbon dioxide (CO_2) every year. A flight from New York to Los Angeles adds 1,400 pounds (635 kilograms) of CO_2 per passenger. Trees can have an impact by reducing atmospheric carbon in two primary ways (see figure at left):

- They sequester ("lock up") CO_2 in their roots, trunks, stems, and leaves while they grow, and in wood products after they are harvested.
- Trees near buildings can reduce heating and air conditioning demands, thereby reducing emissions associated with power production. However, if a tree produces no energy benefits there will be no resulting avoided CO_2.

Combating climate change will take a worldwide, multifaceted approach, but by planting a tree in a strategic location, driving fewer miles/kilometers, or replacing business trips with conference calls, it's easy to see how we can each reduce our individual carbon "footprints".

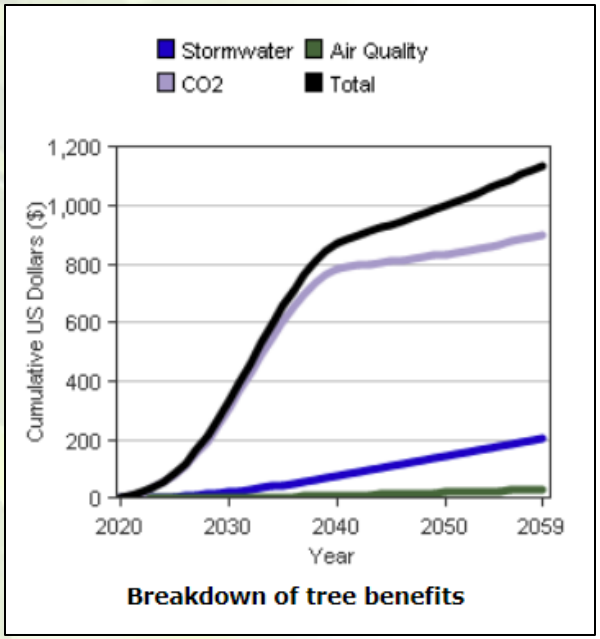
Benefit Based Approach to Choosing Species

Benefit Comparison of Different Tree Species

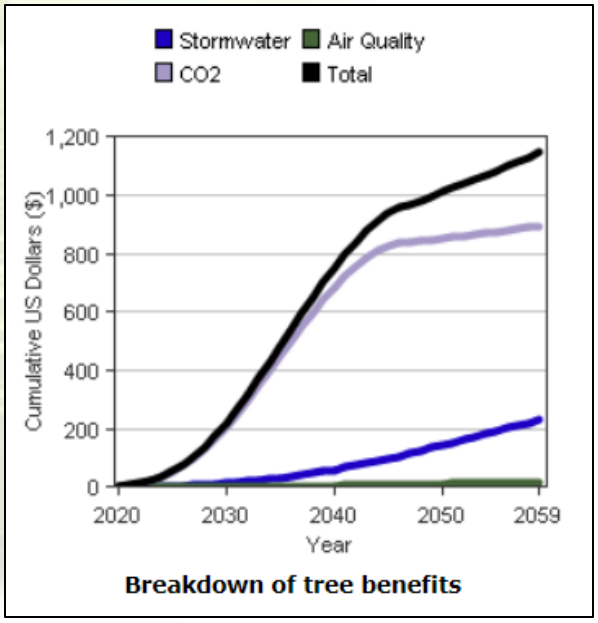
netpsplantfinder.com/

plantmaster.com/share/eplant.php?plantnum=24550

Compare 9 northern hackberry (medium size) with 6 Chinese elm trees (large size)



9 hackberry trees will provide **$1,139** worth of benefits over the next 40 years including diverting **23,197 gallons** of stormwater and remove **438 pounds** of air pollution …



…**6 Chinese elms** will provide **$1,148** worth of benefits over the next 40 years including diverting **25,860 gallons** of stormwater and remove **315 pounds** of air pollution

Design Example Walkthrough

design.itreetools.org

…or *access from*

www.itreetools.org