COMPUTER PROGRAMS THAT AID IN URBAN FOREST MANAGEMENT

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Horticulture Dayz!
March 7, 2016
Front Royal, VA
Why we need technology in urban forestry and how we use it

Technology for urban forest assessment

Technology for urban forest planning and design

Technology out in the field

Feedback on how you use technology
WHY WE NEED TECHNOLOGY

- Urban forests are complex
- Urban forestry is complex
- Technology facilitates analysis and evaluation
- Technology facilitates decision-making and planning
- Technology facilitates communication and record-keeping
HOW WE USE TECHNOLOGY

**Urban Forest Assessment**
- Tree inventory
- Tree canopy analysis
- Tree benefits calculation

**Urban Forest Planning**
- Tree species selection
- Tree landscape placement
- Tree cover prioritization

**Urban Forest Management**
- Tree and pest identification
- Tree disorder diagnosis
- Tree risk evaluation
What is i-Tree?

i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban forestry analysis and benefits assessment tools. The i-Tree Tools help communities of all sizes to strengthen their urban forest management and advocacy efforts by quantifying the structure of community trees and the environmental services that trees provide.

Since the initial release of the i-Tree Tools in August 2005, numerous communities, non-profit organizations, consultants, volunteers and students have used i-Tree to report on individual trees, parcels, neighborhoods, cities, and even entire states. By understanding the local, tangible ecosystem services that trees provide, i-Tree users can link urban forest management activities with environmental quality and community livability. Whether your interest is a single tree or an entire forest, i-Tree provides baseline data that you can use to demonstrate value and set priorities for more effective decision-making.

i-Tree Tools are in the public domain and are freely accessible. We invite you to explore the tools and contribute to the growing body of knowledge and understanding of urban forests.
URBAN FOREST ASSESSMENT

OVERVIEW

BACKGROUND

ASSESS

PLAN

MANAGE

TAKE HOME
URBAN FOREST ASSESSMENT

OVERVIEW

BACKGROUND

ASSESS

PLAN

MANAGE

TAKE HOME

Davis
Relative Age Distribution of Top 10 All Tree Species for All Zones (%)
3/6/2016

- London planetree
- Common crape myrtle
- Chinese pistache
- Chinese hackberry
- Tallowtree
- Callery pear ‘Bradford’
- Hind walnut
- Coast redwood
- European white birch
- Moraine ash
- Citywide Total
URBAN FOREST ASSESSMENT

OVERVIEW

BACKGROUND

ASSESS

PLAN

MANAGE

TAKE HOME

greencitypartnerships.wordpress.com
## Percent of Tree Population in Adrian by DBH Class

**Series: Adrian_2012, Time Period: 2012**

<table>
<thead>
<tr>
<th>Species</th>
<th>0-3</th>
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<th>6-9</th>
<th>9-12</th>
<th>12-15</th>
<th>15-18</th>
<th>18-21</th>
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<td>58.70</td>
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<td>12.10</td>
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<td>4.90</td>
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<td>2.79</td>
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<td>28.40</td>
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<td>17.60</td>
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<td>10.60</td>
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<td>11.60</td>
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<td>9.30</td>
<td>3.23</td>
<td>2.30</td>
<td>2.26</td>
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<td>4.90</td>
<td>41.90</td>
<td>7.25</td>
<td>8.20</td>
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<td>3.21</td>
<td>8.30</td>
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<td>7.99</td>
<td>21.10</td>
<td>5.50</td>
<td>6.10</td>
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<td>15.10</td>
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<td>2.26</td>
<td>29.60</td>
<td>9.95</td>
<td>10.40</td>
<td>1.86</td>
<td>17.20</td>
<td>7.04</td>
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<tr>
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<td>0.65</td>
<td>24.10</td>
<td>2.59</td>
<td>6.80</td>
<td>0.00</td>
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<td>6.43</td>
<td>41.00</td>
<td>6.15</td>
<td>23.20</td>
<td>2.74</td>
<td>5.50</td>
<td>1.37</td>
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<td>Norway spruce</td>
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<td>5.40</td>
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<td>0.77</td>
<td>22.30</td>
<td>7.77</td>
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<td>20.62</td>
<td>15.40</td>
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<td>7.70</td>
<td>7.74</td>
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<td>0.00</td>
<td>11.00</td>
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<td>9.70</td>
<td>0.00</td>
<td>9.70</td>
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<td>26.24</td>
<td>44.60</td>
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<td>9.00</td>
<td>0.00</td>
<td>27.90</td>
<td>9.32</td>
</tr>
<tr>
<td>Tree of heaven</td>
<td>34.50</td>
<td>35.50</td>
<td>12.19</td>
<td>18.04</td>
<td>41.70</td>
<td>13.39</td>
<td>41.70</td>
<td>13.39</td>
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<td>44.60</td>
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<td>9.00</td>
<td>0.00</td>
<td>27.90</td>
<td>9.32</td>
</tr>
<tr>
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<td>0.00</td>
<td>9.70</td>
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<td></td>
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<tr>
<td>Butternut hickory</td>
<td>48.50</td>
<td>23.28</td>
<td>10.40</td>
<td>7.76</td>
<td>30.80</td>
<td>11.98</td>
<td>10.40</td>
<td>7.76</td>
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<td>25.00</td>
<td>18.04</td>
<td>41.70</td>
<td>13.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balsam poplar</td>
<td>12.50</td>
<td>0.00</td>
<td>25.00</td>
<td>0.00</td>
<td>62.50</td>
<td>0.00</td>
<td>62.50</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Tree Plotter LITE©

Tree Plotter LITE© is Plan-It Geo’s free web-based tree inventory software that allows users to map and track trees online and then export the data into a local desktop application. In the free version, anyone can map and inventory new, existing, or proposed trees without a GPS! A tree’s X/Y location is created when you map it using one of the tree template features.
i-Tree Canopy v6.1

Estimate tree cover and tree benefits for a given area with a random sampling process that lets you easily classify ground cover types.

Start using i-Tree Canopy:

Step 1: Load ESRI Shapefile or Define Project Area

Step 2: Configure and Begin Your Survey

Been here before?

Already started an i-Tree Canopy survey? Load it here and resume your work.

Load Previous i-Tree Canopy Survey

Want to compare a completed i-Tree Canopy project to Google Earth historical imagery?

Load Previous i-Tree Canopy Project for Change Survey

Would you like to learn more?

Video Learning Resources

Try Our Sample Project
The more locations you categorize...

...the more accurate your cover type estimates!

...you select the land cover at those locations.
National Tree Benefit Calculator

This 24 inch White oak provides overall benefits of: $239 every year.

While some functional benefits of trees are well documented, others are difficult to quantify (e.g., human social and communal health). Trees' specific geography, climate, and interactions with humans and infrastructure is highly variable and makes precise calculations that much more difficult. Given these complexities, the results presented here should be considered initial approximations—a general accounting of the benefits produced by urban street-side plantings.

Benefits of trees do not account for the costs associated with trees' long-term care and maintenance.

If this tree is cared for and grows to 29 inches, it will provide $291 in annual benefits.

The National Tree Benefit Calculator was conceived and developed by Casey Trees and Davey Tree Expert Co.
SelectTree: Search Trees by Characteristics

Tree Name

Enter a tree name

Max Height (ft)  
Growth Rate  
Tree Shape  
Habit  
Bark Color  
Bark Texture  
Armament  
Branch Strength

Planting near power lines? See Utility Precautions.

Juniperus virginiana 'Elegantissima'
Utility friendly tree. Branches don't droop and resist breakage.
Photo by W. Mark and J. Reimer
Select the right trees...

Right Tree, Right Place
Our Reference Guide is a great place to start looking for the right tree for the right place. Because of regional and local variables, choosing the best trees for your site can be challenging. Dozens of online resources present tree selection, planting and care guidelines. Some of our favorite regional and national sites are listed below.

National and International

UtiliTrees™
Our list recommends small stature, street tough and adaptable trees that are a perfect fit for under utility wires.

U.S. National Arboretum Introductions
Fact Sheets for trees developed at USNA and introduced to the nursery trade include Gold Medal and All America Selection winners.

Recommended Urban Trees
Site Assessment and Tree Selection for Stress Tolerance at Cornell University reveals that many trees developed at J. Frank Schmidt & Son
i-TREE Design v6.0*

i-TREE Design allows anyone to make a simple estimation of the benefits provided by individual trees. With inputs of location, species, tree size, and condition, users will receive an understanding of tree benefits related to greenhouse gas mitigation, air quality improvements, and stormwater interception. With the additional step of drawing a building footprint – and virtually “planting” or placing a tree – tree effects on building energy use can be evaluated.

Tree benefits are estimated for (a) the current year, (b) a user-specified forecast year sometime in the future, (c) the projected total benefits across that future timespan, and (d) the total benefits provided to date (based on estimated tree age). Multiple trees and buildings can be added to compare benefits or to provide a full accounting of a property’s trees.

This tool is intended as a simple and accessible starting point for understanding the value of individual trees or a small population of trees to a community. For more detailed information on urban and community forest assessments, please explore more of the i-TREE website. To learn more about the i-TREE Design model, click here.
**URBAN FOREST PLANNING**

### i-Tree Design v6.0

**Get started with these easy steps:**

1. **Draw Structures**
2. **Place Trees**

**Describe your tree:**

- **Tree species:** Redbud, Eastern
- **Tree diameter:** 5 Inches
- **Tree condition:** Excellent
- **Tree exposure to sunlight:** Full sun

**Tree benefit zones:**

- The colored zones surrounding the structure, which appear as you describe your tree, illustrate the relative monetary value of energy savings that the tree would provide in each zone.
- Hover over each zone to see that energy benefit information displayed below the map.

**To place a tree:**

- Drag this icon to the location on the map where you would like to place your tree.
- Repeat to place additional trees.
- Hover over any tree you have placed on the map to display its benefits.

**Model the tree(s) future crown growth over time:**

- [Model Crown Growth](#)

3. **Estimate Benefits**
i-Tree Design v6.0

Get started with these easy steps:
1. Draw Structures
2. Place Trees

Describe your tree:
- Tree species: Redbud, Eastern
- Tree diameter: 5 Inches
  or circumference: 15.7
- Tree condition: Excellent
- Tree exposure to sunlight: Full sun

Tree benefit zones:
- The colored zones surrounding the structure, which appear as you describe your tree, illustrate the relative monetary value of energy savings that the tree would provide in each zone.
- Hover over each zone to see that energy benefit information displayed below the map.

To place a tree:
- Drag this icon to the location on the map where you would like to place your tree.
- Repeat to place additional trees.
- Hover over any tree you have placed on the map to display its benefits.

Model the tree(s) future crown growth over time:
- Model Crown Growth

3. Estimate Benefits
To date, these trees have provided overall benefits of $426.

While some functional benefits of trees are well documented, others are difficult to quantify (e.g., human social and communal health). Trees' specific geography, climate, and interactions with humans and infrastructure are highly variable and make precise calculations that much more difficult. Given these complexities, the results presented here should be considered initial approximations to better understand the environmental and economic value associated with trees and their placement.

Benefits of trees do not account for the costs associated with trees' long-term care and maintenance.
URBAN FOREST PLANNING

OVERVIEW

BACKGROUND

ASSESS

PLAN

MANAGE

TAKE HOME
Description

Virginia Tech Tree Identification brings the award winning Virginia Tech digital dendrology material to your iPhone. It contains fact sheets for 969 woody plants from all over North America with an in-depth description, range map and thousands of color images of leaves, flowers, fruit, twigs, bark and form.

vTree Support

What's New in Version 2.1.8

Updates that allow a user to sort species by common or latin name.

Free

Category: Reference
Updated: Nov 25, 2015
Version: 2.1.8
Size: 14.2 MB
Language: English
Seller: Michael Whitt
© 2012 Virginia Tech University (Department of Forest Resources and Environmental Conservation)
Rated 4+

Compatibility: Requires iOS 6.0 or later. Compatible with iPhone, iPad, and iPod touch.

Customer Ratings

We have not received enough ratings to display an average for the current version of this application.

All Versions:

More iPhone Apps by Michael Whitt
Description
Leafsnap is the first in a series of electronic field guides being developed by researchers from Columbia University, the University of Maryland, and the Smithsonian Institution. This free mobile app uses visual recognition software to help identify tree species from photographs of their leaves.

Columbia University, University of Maryland, and Smithsonian Institution Web Site > Leafsnap Support

What's New in Version 1.07
- Expanded species coverage to Eastern Canada, with 35 new species
- Fixed minor bugs

iPhone Screenshot

Customer Ratings
Current Version:
⭐⭐⭐ 92 Ratings

All Versions:
⭐⭐⭐⭐⭐ 894 Ratings

More iPhone Apps by Columbia University, University of Maryland, and Smithsonian Institution

View in iTunes

Free
Category: Education
Updated: Jun 05, 2015
Version: 1.07
Size: 87.9 MB
Language: English
Seller: Peter Belhumeur
© 2015 Columbia University, University of Maryland, and the Smithsonian Institution
Rated 4+
URBAN FOREST MANAGEMENT

OVERVIEW

BACKGROUND

ASSESS

PLAN

MANAGE

TAKE HOME

Description
Identify and Report Invasive Plants, Insects and Plant Pathogens in the Mid-Atlantic States

The Mid-Atlantic Early Detection Network (MAEDN) App brings the power of EDDMapS to your smartphone. Now you can identify and report invasive plants, insects, and plant pathogens in the Mid-Atlantic region.

Charles T. Barger Web Site  Mid-Atlantic Early Detection Network Support  ...More

What's New in Version 4.2
- minor bug fixes

This app is designed for both iPhone and iPad

Free
Category: Education
Updated: Jan 20, 2016
Version: 4.2
Size: 457 MB
Language: English
Seller: Charles T. Barger
© UGA Center for Invasive Species and Ecosystem Health
Rated 4+

Compatibility: Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.

Customer Ratings
We have not received enough ratings to display an average for the current version of this application.

More by Charles T. Barger

Species Categories
Report and View Species by Category

All Species
Report and View All Species

My Species List
Short List of Your Selected Species

Negative Report Form
Species not Found in Mapped Area

Upload Queue
View, Edit or Upload Your Reports

EDDMapS Login
Login or Register with EDDMapS

News Feed
Recent Articles on Invasive Species

Categories
Aquatic
Diseases
Grasses
Herbs/Forbs
Insects
URBAN FOREST MANAGEMENT

Overview

Background

Assess

Plan

Manage

Take Home

Description

The Purdue Tree Doctor app has been developed by experts at Purdue University to help people better identify and manage tree problems caused by a variety of factors, including insects and diseases. Landscape professionals, arborists, and garden center personnel can use this app to improve communication with their customers.

Purdue Tree Doctor Support

What's New in Version 1.5.5

- App now works natively with iPad.
- Includes August 2015 content updates.

screenshots

Customer Ratings

We have not received enough ratings to display an average for the current version of this application.

All Versions:

More by Purdue University

Purdue Extension

Local Faces

Countless Connections

Purdue Tree Doctor

Search by Tree Name

Conifers

Shade Trees

Diseases

Insects

Other

Purdue Departments of
- Botany and Plant Pathology
- Entomology

CERIS
Technology is an increasingly important tool in urban forestry analysis, decision-making and communication.

Technology is critical for urban forest assessment, planning, and management.

i-Tree Tools is a suite of free mobile, desktop, and web-based applications that are great for urban forest assessment and planning.

Web-based and mobile apps are increasingly available for a diversity of field applications.
QUESTIONS & COMMENTS

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Horticulture Dayz!
March 7, 2016
Front Royal, VA