



# i-Tree User Group Meeting

*2011 Partners in Community Forestry Conference*



**The National  
Arbor Day Foundation®**

**DAVEY**



# Agenda

- 🌳 State of i-Tree (30 mins)
  - Where is i-Tree today?
  - Where is i-Tree going?
- 🌳 Discussion (30 mins)
  - User question & answer period



# What is i-Tree?



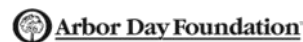
www.itreetools.org



**A series of FREE tools to quantify ecosystem services and values from trees (Free support also)**



i-Tree is a  
Cooperative  
Initiative



# What is i-Tree?



www.itreetools.org



**Quantify effects for individual trees or tree populations (core programs)**



All or any trees



Street trees



Google Maps



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Cooperative  
Initiative





# i-Tree: Quantifies Tree and Forest Resources



www.itreetools.org



## Structure

- Number of Trees, species distribution, canopy cover, etc.

## Functions / Ecosystem Services

- Energy use
- Air pollution
- Carbon
- Biogenic VOC emissions

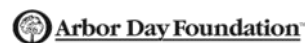
## Management needs

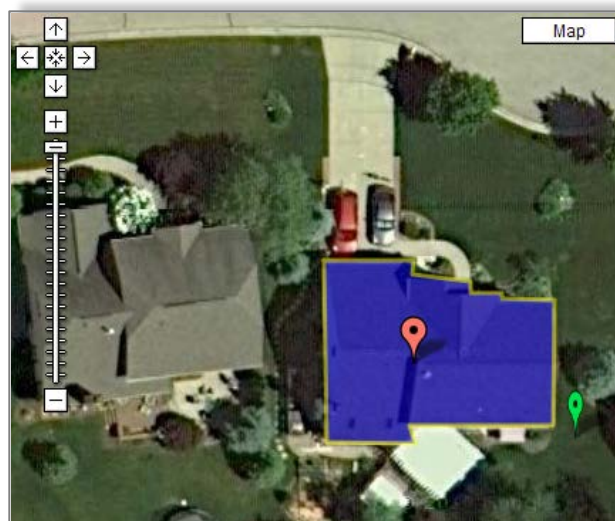
- Pest risk
- Tree health
- Exotic/invasive spp.

## \$ Value



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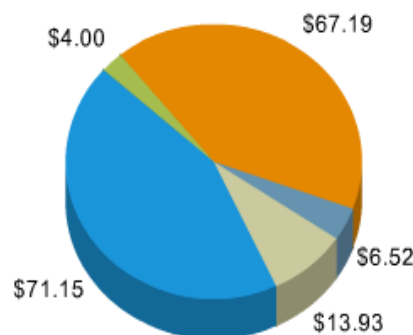




Northern pin oak  
*Quercus ellipsoidalis*

## Easily estimates ecosystem services of trees in your yard using Google Maps and i-Tree

■ Stormwater 
 ■ Cooling 
 ■ Heating  
■ Air Quality 
 ■ CO2



Breakdown of your tree's benefits

**This 21 inch Northern pin oak provides overall benefits of: \$163 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 26 inches, it will provide \$195 in annual benefits.**

# What is i-Tree?



www.itreetools.org



Quantify map or cover data or effects



Google Maps



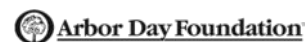
NLCD data



Photo-interpretation

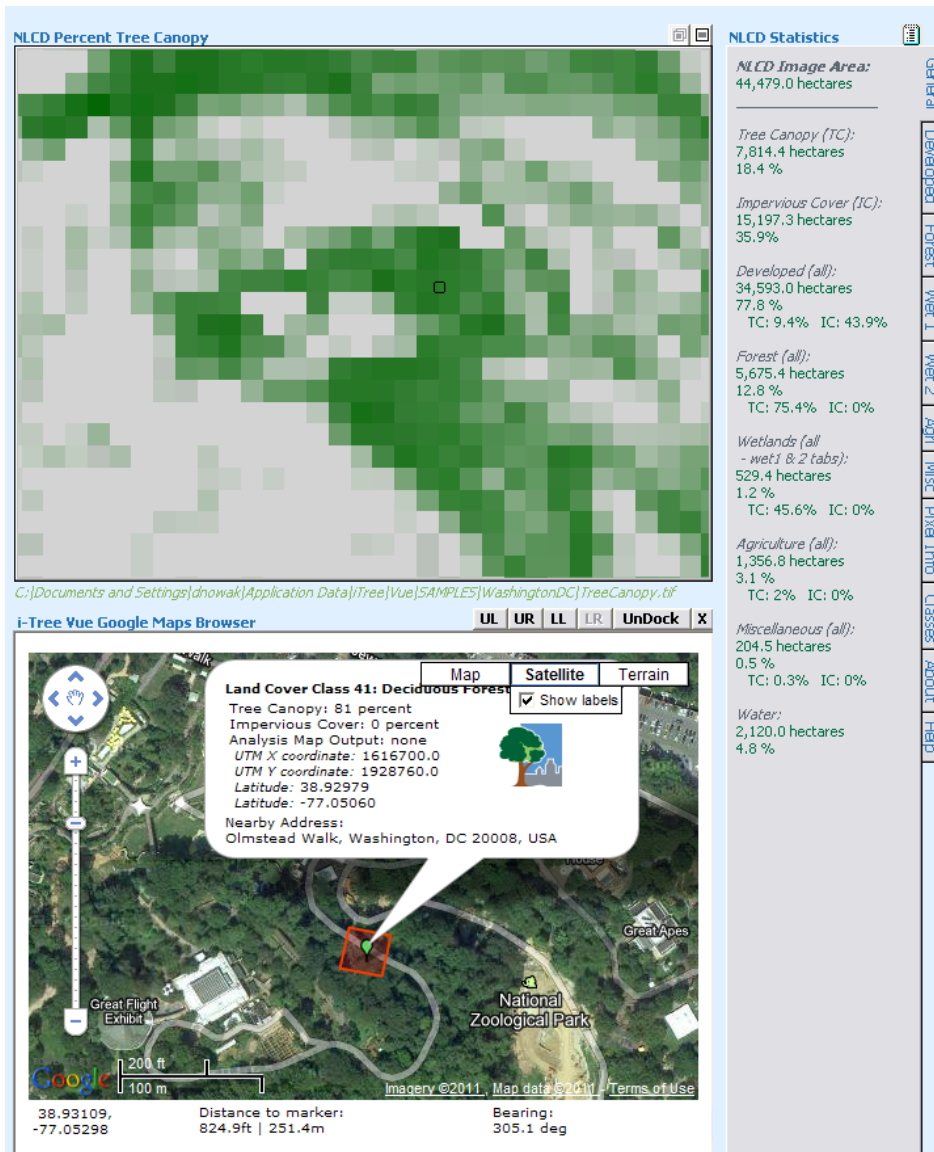


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Uses national cover maps to estimate and project future benefits



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## i-Tree Canopy

Get started in three easy steps!

One Browse to your project area boundary GIS file. The file must be in ESRI Shapefile format and in lat/long coordinates.

? Or

Two Configure the cover classes for your survey.

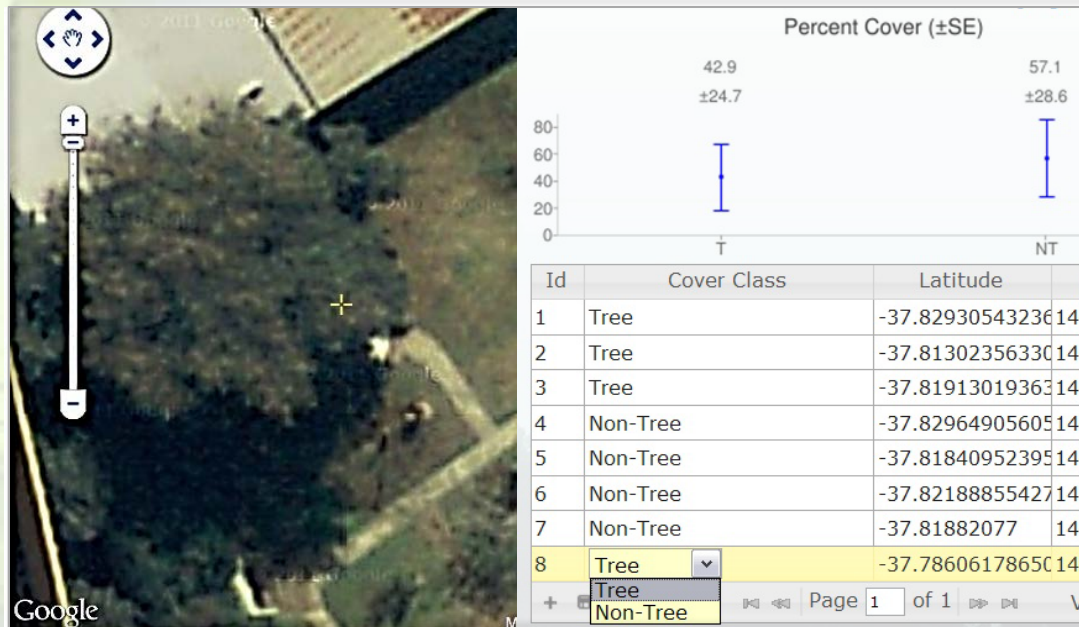
?

Three  ?

[Been here before?](#)

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

?



## Determines % tree cover

- Easy & Fast
- World-wide
- Web-based

# What is i-Tree?



www.itreetools.org



## Specialized programs

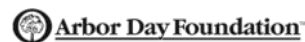


Species selection

Stream flow and quality



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Initiative

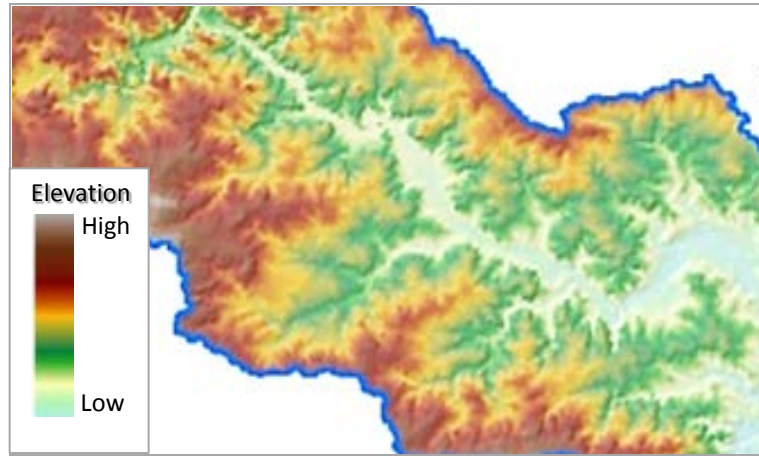






**Easily determine  
best species for  
desired tree  
benefits**







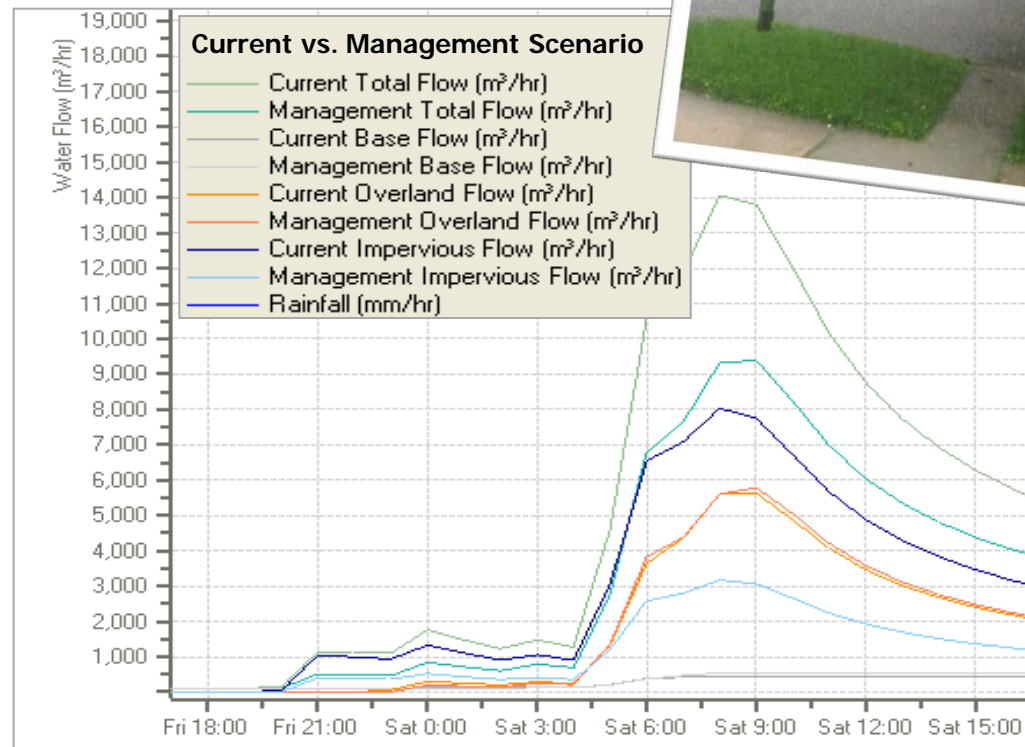


## Quantifies effects of:

-  Tree cover
-  Impervious cover

## on:

-  Stream flow
-  Water quality





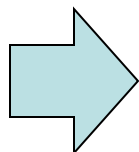
# Version 5.0: Spring 2012



Many new  
features



Invasive  
plant listing



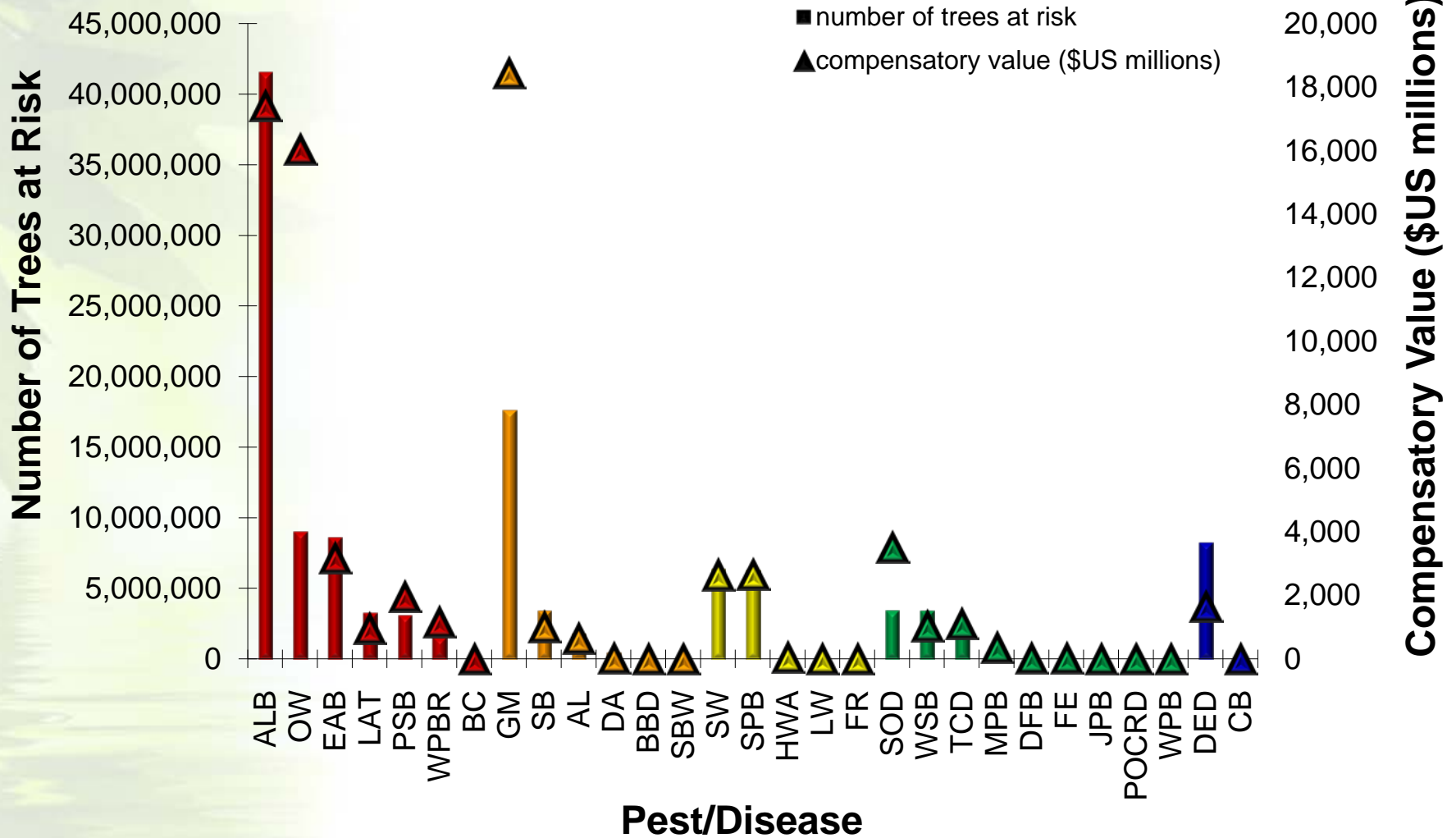
Species listed as invasive or potentially invasive on Illinois or national invasive species lists

Scientific Name	Common Name <sup>a</sup>	% of Pop <sup>b</sup>	% of Leaf Area
<i>Rhamnus cathartica</i>	European buckthorn	28.2	6.55
<i>Lonicera maackii</i>	Amur honeysuckle	2.1	0.48
<i>Robinia pseudoacacia</i>	Black locust	1.9	1.93
<i>Ulmus pumila</i>	Siberian elm	1.4	3.24
<i>Acer platanoides</i>	Norway maple	1.2	3.57
<i>Ailanthus altissima</i>	Tree of heaven	1.2	0.70
<i>Morus alba</i>	White mulberry	1.0	0.84
<i>Acer ginnala</i>	Amur maple	0.5	0.16
<i>Frangula alnus</i>	Glossy buckthorn	0.3	0.09
<i>Picea abies</i>	Norway spruce*	0.2	0.61
<i>Pyrus communis</i>	Common pear*	0.2	0.24
<i>Alnus glutinosa</i>	European alder*	0.2	0.19
<i>Pyrus calleryana</i>	Callery pear	0.2	0.14
<i>Populus alba</i>	White poplar	0.1	0.62
<i>Pseudotsuga menziesii</i>	Douglas fir*	0.1	0.11
<i>Maclura pomifera</i>	Osage orange	0.1	0.11
<i>Elaeagnus umbellata</i>	Autumn olive	0.1	0.09
<i>Prunus cerasifera</i>	Cherry plum*	0.1	0.07
<i>Syringa vulgaris</i>	Common lilac*	0.1	0.01
<i>Euonymus alatus</i>	Winged burningbush	0.1	0.01
<i>Catalpa speciosa</i>	Northern catalpa*	<0.1	0.07
<i>Ulmus parvifolia</i>	Chinese elm*	<0.1	0.03
<i>Phellodendron amurense</i>	Amur corktree*	<0.1	0.02
<i>Elaeagnus angustifolia</i>	Russian olive	<0.1	0.02
<i>Pinus sylvestris</i>	Scotch pine*	<0.1	0.01
<i>Acer palmatum</i>	Japanese maple*	<0.1	0.01
<i>Aesculus hippocastanum</i>	Horsechestnut*	<0.1	0.01
<i>Hibiscus syriacus</i>	Rose-of-sharon*	<0.1	<0.01
<i>Malus pumila</i>	Paradise apple*	<0.1	<0.01
<i>Corylus avellana</i>	European filbert	<0.1	<0.01
<i>Ligustrum vulgare</i>	Common privet	<0.1	<0.01

<sup>a</sup> Species is only listed on national invasive species list (\*)

<sup>b</sup> Percent of total population

# New Pest Risk Ratings



Red indicates pest/disease is within Cook County  
 Orange indicates pest/disease is within 250 miles of Cook County  
 Yellow indicates pest/disease is within 750 miles of Cook County  
 Green indicates pest/disease is outside of these ranges  
 Blue indicates no data on pest range

# i-Tree Eco Random Plot Generator

Load or Draw your project area boundary:



*The file must be in ESRI Shapefile format and in lat/long coordinates.*

Do you wish to conduct a survey that is:

☒ Un-stratified

☐ Stratified

*un-stratified = random plots throughout a single boundary area, such as a city or park.*

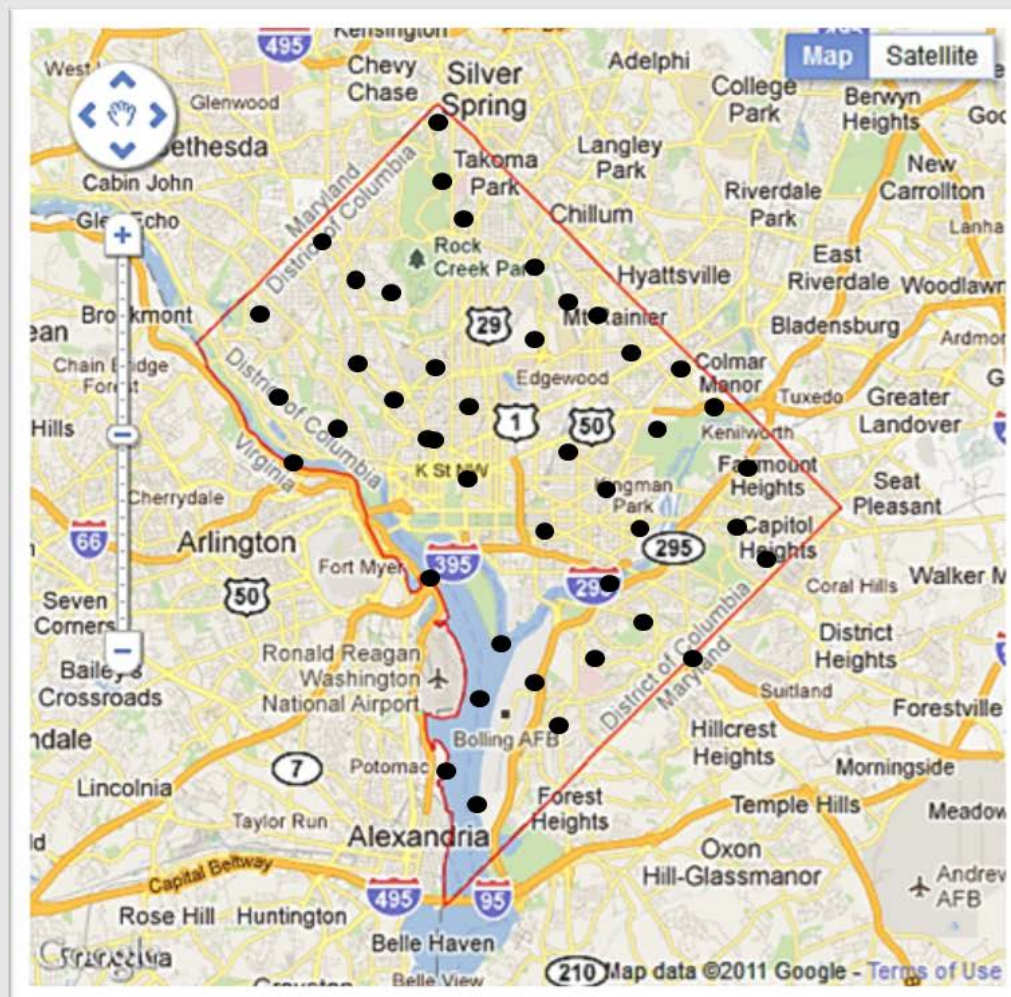
*stratified = random plots throughout multiple boundary areas, such as land use across a city*

Enter the number of plots:

100

Select the plot size:

- |  |                                     |
|--|-------------------------------------|
| <input type="radio"/> 1/5 acre             | <input type="radio"/> 1/5 hectare   |
| <input checked="" type="radio"/> 1/10 acre | <input type="radio"/> 1/10 hectare  |
| <input type="radio"/> 1/20 acre            | <input type="radio"/> 1/20 hectare  |
| <input type="radio"/> 1/100 acre           | <input type="radio"/> 1/100 hectare |

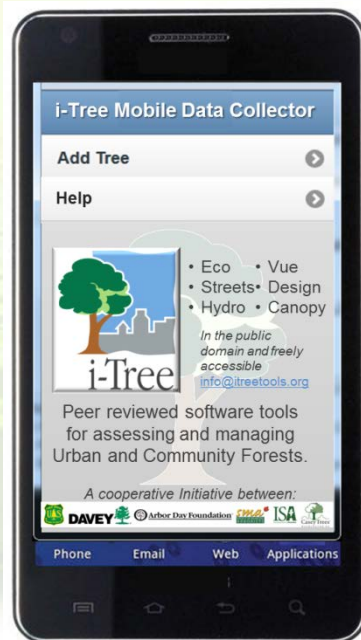
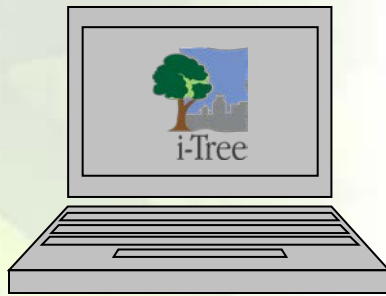


Help

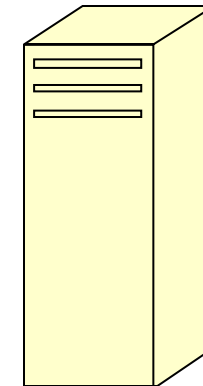
Cancel

Generate Plots

# i-Tree Mobile Data Collection



Send configuration  
Data retrieval



Web  
Server

Retrieve configuration  
Send data

- 🌳 Wireless retrieval & upload
- 🌳 Offline data collection
- 🌳 Works on any mobile browser utilizing HTML5



# i-Tree Design



- 🌳 Ideal planting location
- 🌳 Transpiration
- 🌳 Grow-out
- 🌳 Multiple trees

i-Tree Design Beta Tivoli Way, Sacramento, CA 95819, USA

[Home](#)

Get started with these easy steps:

Enter your tree's species:

Magnolia

Note: If you're looking for a Willow Oak, it's listed as "Oak, Willow". If your tree isn't listed, use the general "Other" listings.





Enter how wide (diameter) your tree is at 4.5 feet above the ground: 15 inches.



Note: This measurement is what foresters call "diameter at breast height".

Enter what type of condition best describes your tree: Excellent

Check here if you would like to evaluate energy effects: ☒

Draw your structure & locate your tree:

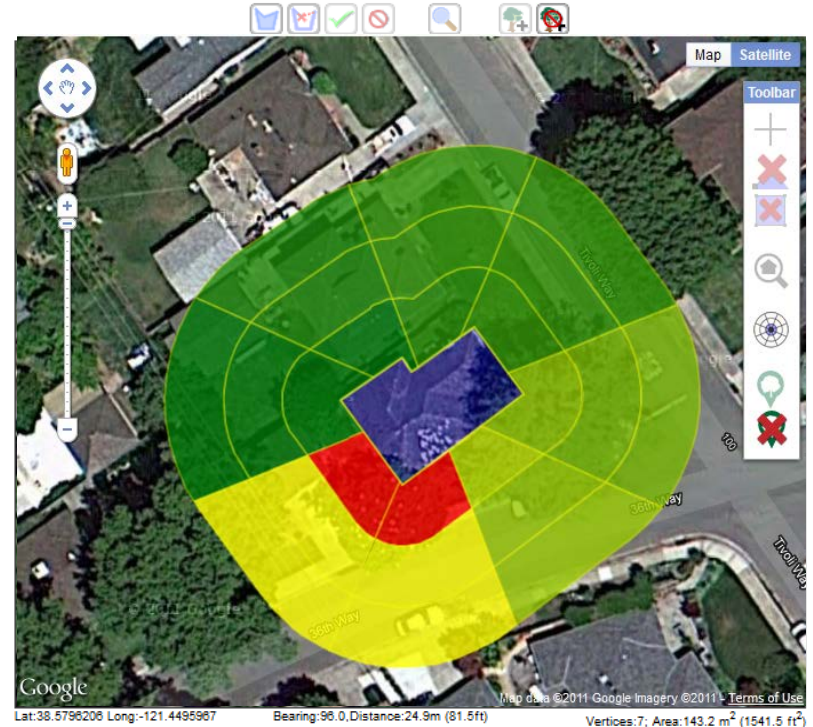
Use the drawing tool  above the map to outline your house or building. Be sure to outline "conditioned" living area only; garages and other unheated or uncooled spaces should not be included. When you are finished outlining your building, click on the  button. You can also use  to delete your last point or use  to cancel the entire drawing.

Now, use the tree tool  above the map to locate your tree. Place the marker as close to the base (or center) of the tree as possible. You cancel the tree placement by clicking .

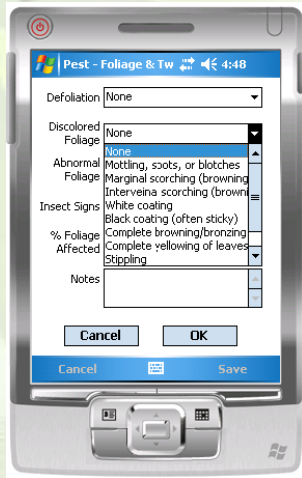
Indicate when your structure was built:

pre-1950

Calculate Benefits



# UFORHIC/Pest Detection

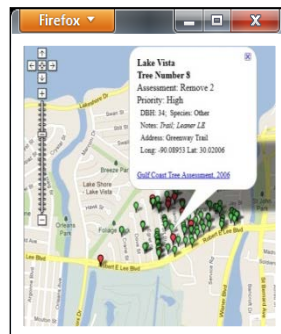


**Distributed Tree Inventory & Pest Detection Data**

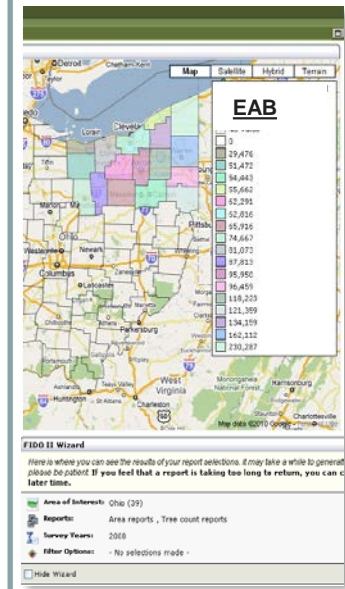


## Local Use

No	Month	Saline volume	Residual
1	January	120	300000
2	February	120	400000
3	March	100	250000
No	Month	Saline volume	Residual
4	April	134	400000
5	May	201	600000
6	June	189	550000
No	Month	Saline volume	Residual
7	July	122	410000
8	August	106	310000
9	September	130	320000
No	Month	Saline volume	Residual
10	October	221	600000
11	November	182	500000
12	December	125	310000



## Regional Monitoring

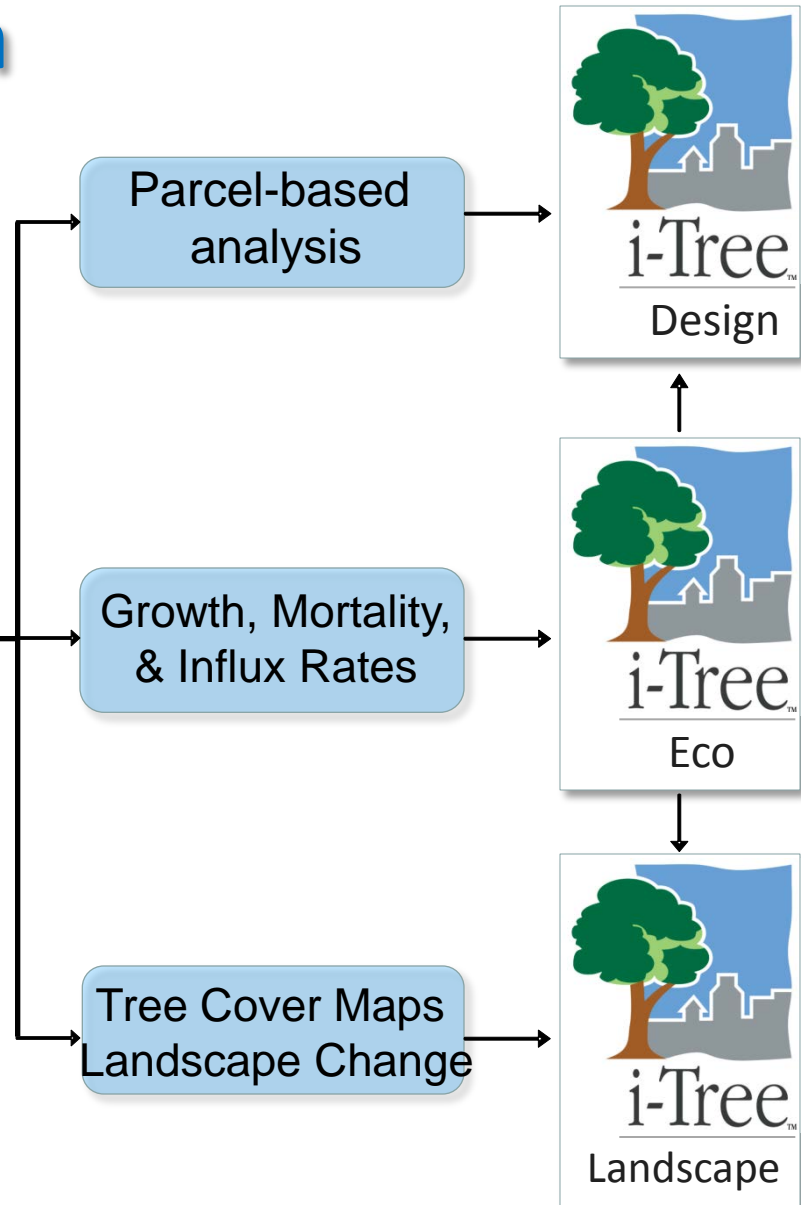


# Other Improvements



- 🌳 Snowmelt routine in *Hydro*
- 🌳 Radar-based precipitation data in *Hydro*
- 🌳 Updated pollution values (BENMAP)
- 🌳 Tree interception and transpiration in *Eco/Design*
- 🌳 PM2.5 removal in *Eco/Design*
- 🌳 VOC emissions in *Eco/Design*
- 🌳 Numerous other improvements to all programs

# i-Tree 2<sup>nd</sup> Generation











Local

SCALE

Regional



# Version 6.0+: 2013+

-  Integration of Streets into Eco
-  Projections of tree pop. and canopy cover
-  Enhanced species information
-  Plot re-measurement analyses
-  Climate change projections
-  Projected development patterns
-  Priority planting and protection maps (Landscape)
  -  Temperature, pollution, eco. services, etc

# What would you like i-Tree to do?



## i-Tree: Your portal for urban forest assessment

- ✓ Visit [www.itreetools.org](http://www.itreetools.org)
- ✓ Email: [info@itreetools.org](mailto:info@itreetools.org)
  - 🌳 Dave Nowak: [dnowak@fs.fed.us](mailto:dnowak@fs.fed.us)
  - 🌳 Scott Maco: [scott.maco@davey.com](mailto:scott.maco@davey.com)
- ✓ User's forum: <http://forums.itreetools.org/>

Thank You!



# Discussion

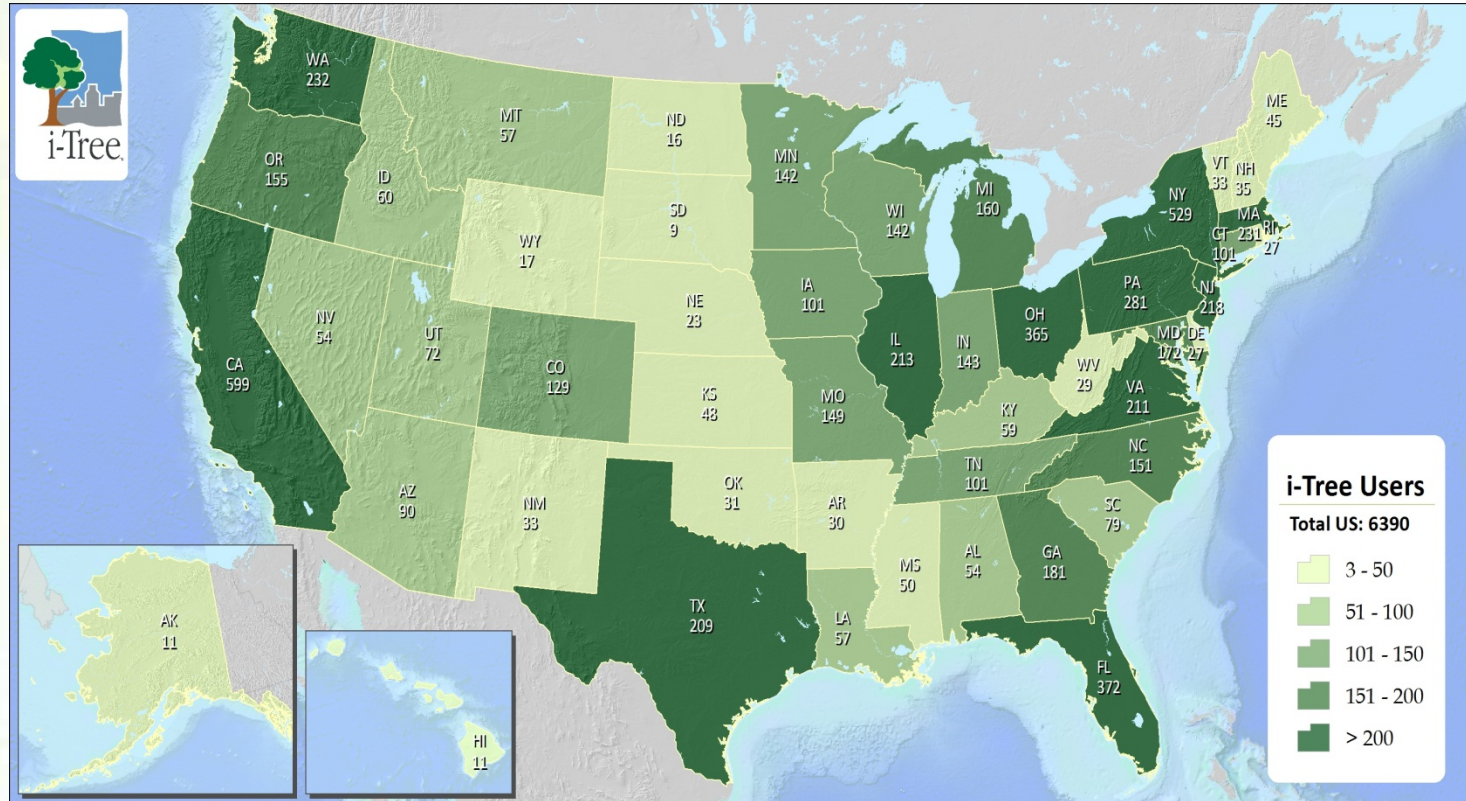




# i-Tree user base continues to grow...



-  City foresters
-  Consultants
-  Non-profits
-  Universities
-  Homeowners
-  Planners



“U.S. benefit analysis snared \$220m for trees”

— Horticulture Week (10/1/2009)