

## 2011 Annual Tree Board Seminar

### Community Outreach Using i-Tree

## What is i-Tree?

- A suite of USDA Forest Service urban and community forestry analysis and benefits assessment software tools



[www.iTreeTools.org](http://www.iTreeTools.org)

- The goal: Provide the tools to help you and your community to promote effective community forest management and sound arboricultural practices.

## What is i-Tree?

- **i-Tree Eco:**  
Ecosystem analysis tool
- **i-Tree Streets:**  
Street tree analysis tool
- **i-Tree Storm:**  
Damage and debris assessment tool
- **National Tree Benefit Calculator**



## i-Tree Streets

### The Streets Process

- Data Collection
  - STRATUM default data fields
  - i-Tree PDA Utility
- Creating a Streets project
  - Importing data
  - Defining the inventory
  - Reporting and interpretation



## i-Tree Streets

### Value Analysis (Costs and Benefits)

- Heating & Cooling Energy
- Carbon trading credits
- Air Pollutants - Transaction costs, damage value and control cost of emissions
- Stormwater Runoff - Retention/detention costs
- Residential Property Increase
- Planting
- Pruning
- Removal and disposal
- Pest and disease control
- Irrigation
- Infrastructure
- Leaf litter cleanup
- Liability
- Administration



## i-Tree Streets

### The Streets Process

- Convert resource units (kWh, lbs) to \$
- Annual Benefits:
  - $B = \text{Energy} + \text{CO}_2 + \text{AQ} + \text{Hydrology} + \text{property value}$
- Annual Costs:
  - $C = \text{Plant} + \text{Trim} + \text{Removal} + \text{IPM} + \text{Irrigation} + \text{Clean-Up} + \text{Sidewalk} + \text{Liability} + \text{Admin} + \text{Other}$
- Net Benefits =  $B - C$
- **Benefits/Costs ratio =  $B/C$**



## i-Tree Streets Helps You ---

- Justify and leverage funds
- Highlight benefits to public
- Plan, prioritize, and budget
- Benchmark progress



## i-Tree Storm

- Standardized method to assess widespread storm damage in a simple, credible, and efficient manner immediately after a severe storm.
- Provides information on the time and funds needed to mitigate storm damage.
- FEMA approved.



## i-Tree Storm

### Project Set-up:

- Create random sample
- Measure tree density and size class
  - Within ROW
  - Also 50' back from ROW edge
- Take final steps
  - Pre-Storm report form: useful estimate
  - Storage for future use



## i-Tree Storm

- Revisit sample segments
  - Record for all trees within 50' of ROW
    - Choose method of estimating debris (by segment)
      - Indirect by average crown loss class
        - 0-25%, 26-50%, etc.
        - Historical records form basis
        - Loss category images available from FS
      - Direct as CY of debris
    - Hazard pruning by size class
    - Hazard removal by size class
  - Paper or PDAs
- Enter data, report results

# i-Tree Storm

Community: \_\_\_\_\_ Report Date: 5/Jan/2005

Note: numbers on this page were generated by a "Storm Damage Estimate Template" as revised in 2004 by the USDA Forest Service and Davey Resource Group, using post-storm field observations of random plots.

**ESTIMATED COST OF TREE DAMAGE \$0**

**COMMUNITY VALUES**

Street Miles	0
Removal Cost/hr	55
Pruning Cost/hr	55
Brush Cost/yard	6

*Check the numbers to the right and correct if necessary.*

**Estimate components**

% Street Miles Sampled	0
Removals	0
Total Removal Hours	0.00
Total Removal Cost	\$0
Hazard Pruning	0
Total Pruning Hours	0.00
Total Pruning Cost	\$0
Total Casualty Loss	0
Total Brush Loads	0.00
Total Brush Cost	\$0
<b>Total Cost</b>	<b>\$0</b>

**DETAILED POST-STORM CALCULATION 1: Removals and Hazard Pruning**

**DN Flight-of-Way Trees**

DNH Class (inches)	Tree Removal			Tree Pruning		
	Total of Removal Trees	Removal Time per Tree	Total Hours for Removal	Total Hazard Pruned Trees	Time per Hazard	Total Hours for Hazard Prune
6-14.9	0	3.7	0	0	0.75	0
15-19	0	5.1	0	0	1	0
20-24	0	7.7	0	0	1.5	0
25-32	0	10.2	0	0	2	0
33-36	0	12.5	0	0	3	0
37-42	0	23.4	0	0	4	0
43+	0	28	0	0	5	0
All Flank	0	6.8	0	0	2.5	0
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Plot Info**

Method

% Street Miles in Sample: 0.00%

# National Tree Benefit Calculator

**National Tree Benefit Calculator**

9/04

Thank you for choosing this site to calculate the economic and ecological benefits of your tree.

Find your climate zone to get started:

Enter your zip code below:

15243

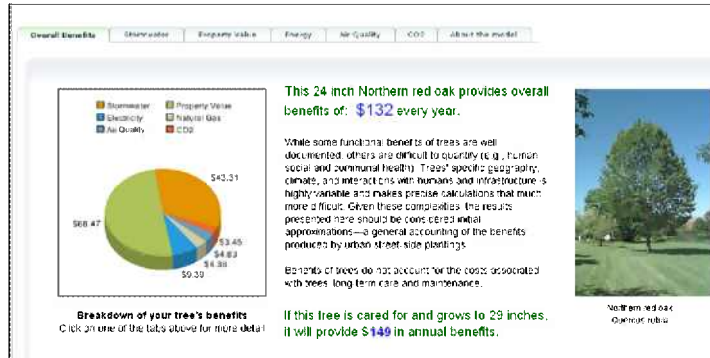
-OR-

Select a zone from the [map](#)

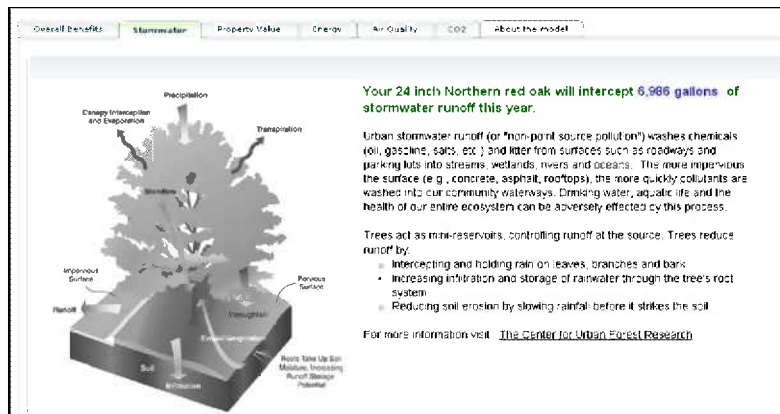
The National Tree Benefit Calculator was developed and managed by: **Casey Trees and Davey Tree Expert Co.**

**Casey Trees** **DAVEY**

# National Tree Benefit Calculator



# National Tree Benefit Calculator



<http://www.treebenefits.com>

## i-Tree As A Community Outreach Tool



### The i-Tree message:

- ✓ Trees are assets
- ✓ Management adds value by increasing return on investment

### i-Tree Supports Tree Boards by:

- Highlighting value of trees
- Justifying investment in tree programs
- Leveraging funds from other sources
- Developing management plans
- Managing data
- Providing a baseline for tracking progress

## i-Tree As A Community Outreach Tool

i-Tree inventory project provides the **PLATFORM** to launch:

- I. Public Education
- II. Civic Planning
- III. Urban Forest Management



Public Education

Civic Planning

Urban Forestry

## i-Tree As A Community Outreach Tool



Public Education

- Tree I.D.
- Tree Anatomy
- Tree Biology
- Tree Care
- Urban Forest Management

Civic Planning

- Tree Canopy Analysis
- Land Development
- Tree Ordinances

Urban Forestry

- Tree Inventory
- Forest Health
- Maintenance
- Risk Assessment
- Planting

## i-Tree As A Community Outreach Tool



Public Education

- Tree I.D.
- Tree Anatomy
- Tree Biology
- Arboriculture

Civic Planning

- **Tree Canopy Analysis**
- **Land Development**
- **Tree Ordinances**

Urban Forestry

- Tree Inventory
- Forest Health
- Maintenance
- Risk Assessment
- Planting

## iTree As A Community Outreach Tool



Public Education

- Tree I.D.
- Tree Anatomy
- Tree Biology
- Arboriculture

CMC Planning

- Tree Canopy Analysis
- Land Development
- Tree Ordinances

Urban Forestry

- **Tree Inventory**
- **Forest Health**
- **Maintenance**
- **Risk Assessment**
- **Planting**
- **Budget**

## i-Tree in Kentucky

- Kentucky Division of Forestry Community Volunteer Projects



PROSPECT

CHEROKEE TRIANGLE

PARK DUVALL

# i-Tree in Kentucky

## PROSPECT, KY



- Community Volunteer Tree Inventory

- i-Tree STREETS



## i-Tree in Kentucky

### Prospect, KY

- o Prospect Forestation Board
- o Mayor Todd Eberle
- o Tree City USA

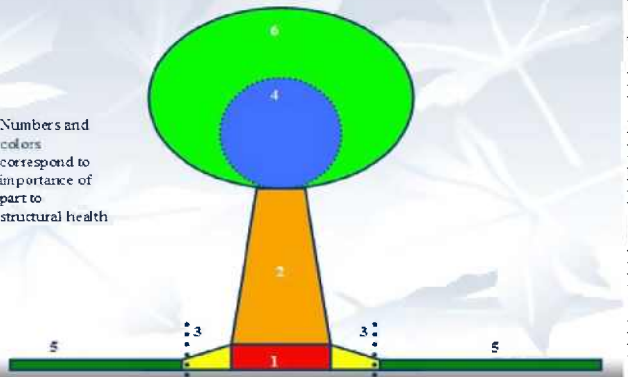


## i-Tree in Kentucky

### Prospect, KY

#### 6 Zones of Tree to Observe for Condition Rating

Numbers and colors correspond to importance of part to structural health



- o Classroom Training
- o Inventory Protocol
- o Data Fields
- o Condition Rating

## i-Tree in Kentucky Prospect, KY



- **Outdoor Training**
- Tree I.D.
- Tree Measuring
- Tree Condition
- Tree Anatomy
- Tree Biology

## i-Tree in Kentucky Prospect, KY



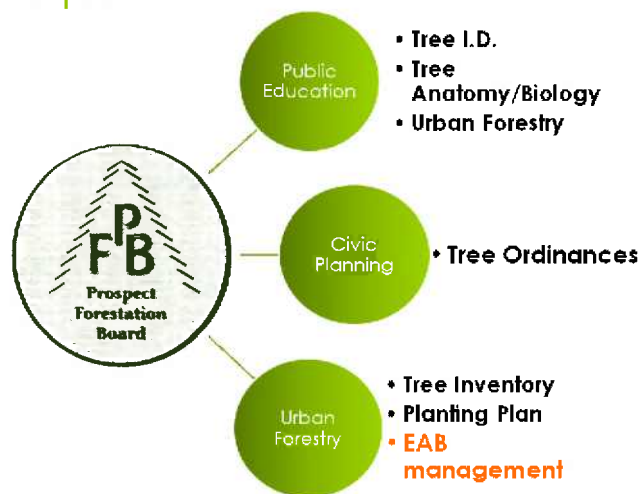
- **Outdoor Training**
- Tree I.D.
- Tree Measuring
- Tree Condition
- Tree Anatomy
- Tree Biology

## i-Tree in Kentucky

### Prospect Tree Inventory Results

- ❖ A Dozen volunteers trained on tree i.d., tree biology/anatomy, urban forest management
- ❖ Inventory of all ROW trees including location, diameter, condition
- ❖ List of Planting Locations
- ❖ List of all ASH trees, their location and condition
- ❖ Value of ecosystem services provided by trees

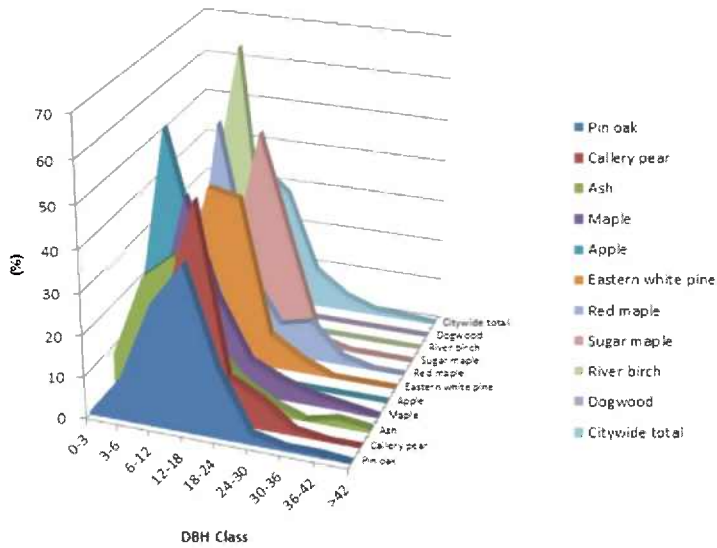
## i-Tree in Kentucky Prospect



**Prospect**

**Relative Age Distribution of Top 10 Public Tree Species (%)**

9/23/2011



**Prospect**

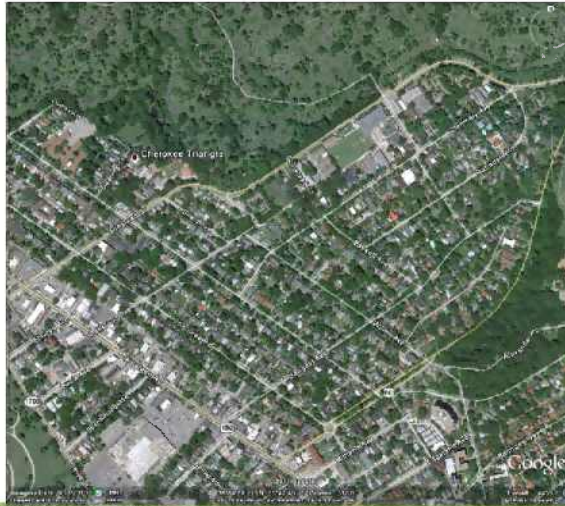
**Total Annual Benefits, Net Benefits, and Costs for Public Trees**

9/20/2011

Benefits	Total (\$) Standard Error	\$/tree Standard Error	\$/capita Standard Error
Energy	6,986 (N/A)	4.72 (N/A)	1.30 (N/A)
CO2	1,274 (N/A)	0.86 (N/A)	0.27 (N/A)
Air Quality	2,494 (N/A)	1.69 (N/A)	0.54 (N/A)
Stormwater	21,888 (N/A)	14.80 (N/A)	4.70 (N/A)
Aesthetic/Other	94,463 (N/A)	63.87 (N/A)	20.28 (N/A)
<b>Total Benefits</b>	<b>127,105 (N/A)</b>	<b>85.94 (N/A)</b>	<b>27.29 (N/A)</b>
<b>Costs</b>			
Planting	990	0.67	0.21
Contract Pruning	4,513	3.05	0.97
Pest Management	2,164	1.46	0.46
Irrigation	0	0.00	0.00
Removal	3,472	2.35	0.75
Administration	1,120	0.76	0.24
Inspection/Service	190	0.13	0.04
Infrastructure Repairs	3,316	2.24	0.71
Litter Clean-up	2,290	1.55	0.49
Liability/Claims	0	0.00	0.00
Other Costs	894	0.60	0.19
<b>Total Costs</b>	<b>18,949</b>	<b>12.81</b>	<b>4.07</b>
<b>Net Benefits</b>	<b>108,156 (N/A)</b>	<b>73.13 (N/A)</b>	<b>23.22 (N/A)</b>
<b>Benefit-cost ratio</b>	<b>6.71 (N/A)</b>		

# i-Tree in Kentucky

## ● Cherokee Triangle Neighborhood



● Community Volunteer Tree Inventory

● iTree STREETS

# i-Tree in Kentucky

## ● Cherokee Triangle Neighborhood



● Community Volunteer Tree Inventory

● iTree STREETS



# i-Tree in Kentucky

Louisville

## Total Annual Benefits, Net Benefits, and Costs for Public Trees

9/22/2011

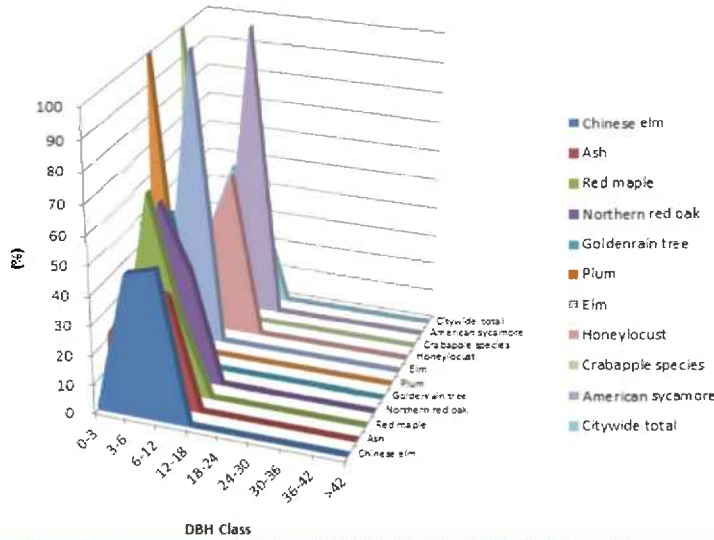
Benefits	Total (\$) Standard Error	\$/tree Standard Error	\$/capita Standard Error
Energy	8,896 (N/A)	7.21 (N/A)	0.00 (N/A)
CO2	1,537 (N/A)	1.08 (N/A)	0.00 (N/A)
Air Quality	2,975 (N/A)	2.41 (N/A)	0.00 (N/A)
Stormwater	77,720 (N/A)	77.48 (N/A)	0.00 (N/A)
Aesthetic/Other	140,115 (N/A)	113.64 (N/A)	0.00 (N/A)
<b>Total Benefits</b>	<b>181,043 (N/A)</b>	<b>146.83 (N/A)</b>	0.00 (N/A)
<b>Costs</b>			
Planting	0	0.00	0.00
Contract Pruning	0	0.00	0.00
Pest Management	0	0.00	0.00
Irrigation	0	0.00	0.00
Removal	0	0.00	0.00
Administration	0	0.00	0.00
Inspection/Service	0	0.00	0.00
Infrastructure Repairs	0	0.00	0.00
Litter Clean-up	0	0.00	0.00
Liability/Claims	0	0.00	0.00
Other Costs	0	0.00	0.00
<b>Total Costs</b>	<b>0</b>	<b>0.00</b>	<b>0.00</b>
<b>Net Benefits</b>	<b>181,043 (N/A)</b>	<b>146.83 (N/A)</b>	<b>0.00 (N/A)</b>
<b>Benefit-cost ratio</b>	<b>0.00 (N/A)</b>		



Louisville

**Relative Age Distribution of Top 10 Public Tree Species (%)**

10/13/2011



Louisville

**Total Annual Benefits, Net Benefits, and Costs for Public Trees**

10/13/2011

Benefits	Total (\$) Standard Error	\$/tree Standard Error	\$/capita Standard Error
Energy	1,136 (N/A)	1.67 (N/A)	0.00 (N/A)
CO2	331 (N/A)	0.49 (N/A)	0.00 (N/A)
Air Quality	468 (N/A)	0.69 (N/A)	0.00 (N/A)
Stormwater	3,866 (N/A)	5.69 (N/A)	0.00 (N/A)
Aesthetic/Other	27,169 (N/A)	40.01 (N/A)	0.00 (N/A)
<b>Total Benefits</b>	<b>32,970 (N/A)</b>	<b>48.56 (N/A)</b>	<b>0.00 (N/A)</b>
<b>Costs</b>			
Planting	0	0.00	0.00
Contract Pruning	0	0.00	0.00
Pest Management	0	0.00	0.00
Irrigation	0	0.00	0.00
Removal	0	0.00	0.00
Administration	0	0.00	0.00
Inspection/Service	0	0.00	0.00
Infrastructure Repairs	0	0.00	0.00
Litter Clean-up	0	0.00	0.00
Liability/Claims	0	0.00	0.00
Other Costs	0	0.00	0.00
<b>Total Costs</b>	<b>0</b>	<b>0.00</b>	<b>0.00</b>
<b>Net Benefits</b>	<b>32,970 (N/A)</b>	<b>48.56 (N/A)</b>	<b>0.00 (N/A)</b>
<b>Benefit-cost ratio</b>	<b>0.00 (N/A)</b>		

## i-Tree in Kentucky

### ❖ Lessons Learned

#### ○ Keep Data Collection Simple

- 6-8 Data Fields
- Preset Species List

#### ○ Training Time

- Species I.D. Takes TIME
- Condition Rating Takes Time
- Block Assignments Clearly understood

#### ○ Quality Control

- Spot Check During Inventory to Catch Problems
- Watch for Corners, Mis-I.D.

## Questions?

i-Tree: Proving Trees Pay Us Back!

